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# USSR Report

NATIONAL ECONOMY



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9 APRIL 1987

USSR REPORT  
NATIONAL ECONOMY

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CHANGES IN ENTERPRISE MODERNIZATION FINANCING PROPOSED

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 12, Dec 86 pp 106-109

[Article by L. Rotshteyn, candidate of economic sciences, under the rubric "The Reader and The Magazine; Making a Suggestion": "The Production Development Fund: Improving its Formation and Use"; first paragraph is source introduction; capitalized passages printed in boldface]

[Text] THE NEW MANAGEMENT CONDITIONS REQUIRE CHANGES IN THE PROCEDURE FOR FINANCING MEASURES FOR RETOOLING AND MODERNIZATION. IT IS NECESSARY TO DEVELOP DIFFERENTIATED STANDARDS FOR ALLOCATIONS INTO THE PRODUCTION DEVELOPMENT FUND.

The state plan for the USSR's economic and social development for the years 1986 through 1990 defined a specific program for the retooling and modernization of operating enterprises. The share of allocations for these purposes within the overall volume of capital investments for production construction will be increased from 38.5 percent in 1985 to 50.5 percent in 1990. Such a substantial change in the investment policy made it possible to provide for basic improvements in the qualitative modernization of basic production assets and to overcome the tendency that existed in previous years towards physical wear-out and obsolescence.

REINFORCEMENT OF THE ORIENTATION TOWARDS THE RETOOLING AND MODERNIZATION OF OPERATING ENTERPRISES PROVIDES A NUMBER OF ADVANTAGES IN COMPARISON TO THE EXPANSION OF THE ENTERPRISES AND NEW CONSTRUCTION.

FIRST, the retooling and modernization of the operating production potential is accomplished faster than new construction, and the time factor in economics in general, and in construction in particular, is enormously important. As the practice of the most progressive enterprises shows, the establishment and exploitation of capacities during modernization and retooling take 50 to 75 percent less time in comparison to new construction. According to an investigation in 1985 by the USSR CSA [Central Statistical Administration] of 5 machine building ministries operating under the new management conditions, on the average to establish 1 million rubles worth of basic production assets using retooling required 0.3 years (or 3.6 months), whereas for the entire production construction it took 0.62 years, i.e., more than twice as long.

[Footnote 1] [ECONOMICHESKAYA GAZETA, 1985, No 50.] Under these conditions

the introduction of the achievements of science and technology--the main resource for the economy's intensification--into production is accelerated.

SECOND, expenditures per unit of capacity put into operation during retooling are substantially lower than during expansion of enterprises and new construction.

THIRD, during the production retooling and modernization, the structure of the basic production assets is improved, their passive section (the buildings and structures) is relatively reduced and the active section (the machines and equipment) is increased, which creates the necessary prerequisites and conditions for a greater rate of return. The funds allotted for these purposes are repaid on the average three times faster than during the establishment of similar production capacities using new construction and production expansion.

FOURTH, during the retooling and modernization of operating enterprises the growth of production output and the improvement of quality, as a rule, is ensured in the previous areas and without increasing the number of work places (and frequently reducing them), which is greatly important under the conditions of the demographic situation that is taking shape. The existing labor collectives are being maintained and strengthened and the skills of the workers are being improved. In accordance with the reasons indicated, the production retooling and modernization have not only technical and general economic significance, but also important social significance.

THE MAIN SOURCE FOR THE FINANCING OF THE PRODUCTION RETOOLING AND MODERNIZATION SHOULD BE THE PRODUCTION DEVELOPMENT FUND ESTABLISHED IN THE PRODUCTION ASSOCIATIONS AND THE ENTERPRISES. At the 27th CPSU Congress, the task was set up of "Enhancing the role of the production development funds in the re-equipping of associations and enterprises, ensuring the original aim of the resources of the indicated funds for these purposes." [Footnote 2] [Materialy XXVII syezda Kommunisticheskoy partii Sovetskogo Soyuza. [Materials of the 27th CPSU Congress], Moscow, Politzdat, 1986, p 278]

The economic essence of the production development fund is expressed in the economic relationships between the associations (enterprises) and society with regards to the reproduction of the basic assets assigned to the associations (enterprises), in other words, with regards to the financing, on a self-supporting basis, of the production retooling based on the achievements of scientific progress. This calls for furthering the gradual transition of all sectors of industry to the new management conditions, which will enable the production associations and enterprises to solve independently and on an operationally efficient basis the problems of maintaining the basic production assets on a contemporary technical level. As the results of operations for the years 1984-1985 have proven, in the production associations and enterprises in which the mastery of the new management conditions has been accomplished, including also the system for financing and using the production development fund, the introduction of highly productive techniques has been accelerated, the production technology has been improved, the stock of

advanced metal-working equipment has been increased and the quantity of N/C [numerically controlled] lathes, industrial robots and the means for the mechanization and automation of loading and unloading operations, lifting and transporting operations and warehousing operations has increased. Expenditures for retooling financed from the development fund in 1984 as compared to the preceding year increased by 14.5 percent for the Ministry of Heavy and Transport Machine Building and by 5.7 percent for the Ministry of the Electrical Equipment Industry. In addition, in the Ministry of Heavy and Transport Machine Building 34 percent of the total expenditures from the fund was used to pay off long-term bank loans taken out for retooling and in the Ministry of the Electrical Equipment Industry 15.3 percent was used.

For a number associations and enterprises of these ministries, the growth rate of expenditures for retooling in 1984 was significantly higher. Thus, at the Velikolukskiy Electrotechnical Porcelain Plant, it amounted to 200.3 percent of the 1983 level, at the Sibelectromotor PA [Siberian Electromotor Production Association] it was 182 percent and at the Pskov Heavy Electric Welding Equipment Plant it was 181.9 percent.

The results of operations for 1985 reaffirmed that the basic departure points for the formation and use of the production development fund expand the resources and independence of the production associations in accelerating production retooling. The overall total of expenditures from the development fund increased in 1985 in comparison to 1984 for the Ministry of Instrument Making, Automation Equipment and Control Systems by 15 percent, for the Ministry of the Electrical Equipment Industry by 14 percent, for the Ministry of Heavy and Transport Machine Building by 12 percent, for the Ministry of Tractor and Agricultural Machine Building by 7 percent, for the Ministry of the Machine Tool and Tool Building Industry by 7 percent, and for the Ministry of Chemical and Petroleum Machine Building by 3 percent.

At the same time, the operational experience of the production associations and enterprises under the experimental conditions in 1984 and 1985 showed that there were still shortcomings and unresolved problems in the system for the formation and use of the production development fund.

The established amounts of the fund have not always ensured the actual requirement of the associations and enterprises for the resources for retooling basic assets. Not all the ministries differentiated the standards for allotments to the fund according to the enterprises. The right granted to the associations and enterprises to direct amortized allotments for capital repairs to production retooling was seldom used. There were instances when the enterprises were not provided completely with material resources and equipment.

Some production associations and enterprises did not have prospective all-around plans for production retooling. The resources of the production development fund were sometimes used for things that were better bought instead of for what was necessary and corresponded to the requirements for technical progress. Meanwhile, as noted at the April (1985) CPSU Central



Committee Plenum, it is important to endure the transition to the radically new technological systems and to the new generation techniques, which yield the highest efficiency.

In the 12 July, 1985 resolution of the CPSU Central Committee and the USSR Council of Ministers, serious measures have been provided for the further improvement of the system for the formation and use of the production development fund and for the improvement of the material and technical ensurance of capital investments realizable using this fund. It is very important that these measures be fully implemented.

IN THE PROCESS OF IMPLEMENTING THE 5-YEAR PLAN, IT WOULD BE ADVISABLE TO IMPLEMENT SOME ADDITIONAL MEASURES FOR INCREASING THE PRODUCTION DEVELOPMENT FUND'S ROLE IN PRODUCTION RETOOLING AND MODERNIZATION.

At the present time, the technical re-equipping of production is being accomplished both through the resources of the development fund (decentralized capital investments) and through centralized capital investments. Thus, according to the 1986 plan, the production development fund with respect to the volume of capital investments for production retooling and modernization amounts, for example, for the Ministry of Tractor and Agricultural Machine Building and the Ministry of Power Machine Building to less than 50 percent. At the same time, part of the indicated fund's resources are used to pay off existing bank loans.

The amounts of the production development fund do not provide completely the capital investments for retooling. According to the machine building ministries, for the 1986 plan they amount to from 44 to 87 percent with respect to the capital investments just for retooling.

A large portion of the expenditures for retooling and modernization of enterprises are maintained in the centralized capital investments and in the subsequent years of the 5-year plan. This, of course, limits the initiative and independence of the production associations (enterprises) in the technical re-equipping of production.

IT SEEMS THAT IT WOULD BE ADVISABLE TO CONCENTRATE ALL THE FINANCIAL RESOURCES FOR THE PRODUCTION RETOOLING AND MODERNIZATION, INCLUDING AS WELL THE RESOURCES FROM THE CENTRALIZED CAPITAL INVESTMENTS, IN THE PRODUCTION DEVELOPMENT FUND. It is advisable to do this simultaneously for all the remaining years of the 5-year plan during the elaboration of the 1987 economic and social development plan. With such a situation, in essence, the resources designated for new construction and expansion of enterprises are maintained in the make-up of the centralized capital investments, which the higher organs dispose of. The financial resources intended for retooling and modernization will be concentrated completely in the production development fund, and will be determined by the associations and enterprises themselves in accordance with established stable standards for allotments from profits and the amortization for modernization. The amount of the development fund will depend on the results of economic activities. Under these conditions, the

capability and independence of the associations and enterprises in solving the problems of technical progress on an operationally efficient basis is significantly expanded.

Such a solution to the problem completely conforms to the resolution of the CPSU Central committee and the USSR Council of Ministers "On measures for the improvement of the management mechanism in construction," by which it has been determined that beginning with 1987, the financing of capital investments for the retooling and modernization of operating enterprises should be done using the production development fund's resources.

It is very important that the transfer of the corresponding centralized capital investments into the production development fund be accomplished simultaneously during the elaboration of the plan for 1987 and the subsequent years of 5-year plan. This will make it possible to establish stable standards for allotments into the production development fund for the years 1987 through 1990, to carry out the formation of the production development fund in 1988, 1989 and 1990 in accordance with these standards and, taking into account the existing financial resources, to develop on a timely basis an economically based progressive plan for the technical re-equipping of the associations (enterprises).

In the plans for the USSR's economic and social development for the years 1987 through 1990, it is necessary to allot by individual line the material and technical resources designated for production retooling and modernization, realizable using the production development fund, as well as the limits for construction and installation work.

Based on the increased amount of the production development fund, it is necessary to define precisely in the plan for 1987 and the subsequent years of the 5-year plan, the standards for allotments into this fund according to the ministries. In turn, the ministries, within the limits of the standards for the sectors of industry with the assistance of the scientific research organizations need to DEVELOP STABLE STANDARDS FOR ALLOTMENTS TO THE PRODUCTION DEVELOPMENT FUND (WITH THE AIM IN THE NECESSARY INSTANCES OF 100 PERCENT AMORTIZATION OF THE MODERNIZATION) FOR THE REMAINING YEARS OF THE 5-YEAR PLAN, WHICH ARE ECONOMICALLY BASED AND DIFFERENTIATED ACCORDING TO THE PRODUCTION ASSOCIATIONS AND THE ENTERPRISES. The standards should reflect the special features of the operation and the development of the production associations (enterprises), the real requirement in resources for the technical improvement of production, the introduction of new techniques and the replacement of outdated equipment.

However, in the interim statement on the procedure for the formation and use of the production development fund by production associations (enterprises) and organizations, issued in January of 1986, it was stipulated that the standard established in the 5-year plan for a ministry for the formation of the production development fund using allotments of profits is the sole (identical) one for all the profit-making enterprises of the ministry, whereas the standard for allotments from amortization of modernization MAY (emphasis

on "MAY" and not "SHOULD") be differentiated according to the enterprises. Under these conditions, some ministries have not provided for differentiation even of the standard for allotments to the production development fund from amortization (with the aim in the necessary instances of up to 100 percent amortization for modernization), and the identical standards for all associations and enterprises in many instances do not reflect the actual requirement in resources necessary for production retooling and modernization and the peculiarities of their economic and financial activities.

B. Fomin, the general director of the Leningrad Elektrosila Association [Electrotechnical Plant imeni S. M. Kirov], correctly noted, "We will begin with the fact that the established standards for allotments for production development for the time being are identical both for new, or what are called brand-new, enterprises and for ones similar to Elektrosila, where there are shops that were erected at the beginning of the century and nearly half the equipment has an "age" of 20 years. It is perfectly clear: old plants with large technical traditions and experienced personnel will be placed in a deliberately disadvantageous position."

Other association managers and scientific workers have also pointed out the necessity of differentiating the standards for allotments into the production development fund. Taking these considerations into account, along with the analysis of the practice of forming the development fund, the USSR Gosplan and the USSR Ministry of Finance made changes on 25 August, 1986, to the above-referenced interim statement, stipulating that the standards established in the 5-year plan for a ministry for the formation of the production development fund both through allotments from the amortization for modernization and through profits may be differentiated according to the enterprises.

During the elaboration of the differentiated standards for allotments according to production associations (enterprises), it is necessary to consider to a lesser degree the following economic factors:

**THE STRUCTURE OF THE BASIC PRODUCTION ASSETS.** The higher the share of the active part of the basic assets, primarily the machines and equipment, the greater the requirement for resources for their replacement and improvement, all other conditions being equal;

**THE DEGREE OF WEAR OF THE BASIC ASSETS.** Production associations (enterprises) that have basic assets that are old from the standpoint of age, as a rule, require more for their renovation than ones recently put into operation;

**THE SERVICE LIFE OF THE BASIC ASSETS.** The shorter it is, the higher the requirement for resources for their renovation;

**THE PECULIARITIES OF THE DEVELOPMENT OF THE INDIVIDUAL PRODUCTION ASSOCIATIONS AND ENTERPRISES, AND ALSO THE REQUIRED RENEWAL RATES FOR THE EQUIPMENT IN CONFORMITY WITH THE DEMANDS OF SCIENTIFIC AND TECHNICAL PROGRESS.**



All of this will significantly enhance the production development fund's role in carrying out production retooling and modernization based on the achievements of scientific and technical progress. At the same time, it is obvious that the increase alone in the production development funds still does not solve the problem of retooling. It is no less important to use them efficiently, with the greatest rate of return.

In each sector, in the associations and enterprises, complete programs for production retooling and modernization and for production's continuous renewal based on contemporary techniques and advanced technology should be worked out and implemented. So that the plans for production retooling, worked out at the associations and enterprises, would be of high quality and meet the requirements of technical progress, their compilation should be preceded by a lot of preparatory work.

It is necessary to conduct a thorough analysis of the technical and economic level of actual production, using the results of the inventorying of the basic production assets, the certification of the work places and the measures for their efficient use, the production associations' passports [economic reports] and other data which characterize the technical level of production. The experience of the Dnepropetrovsk Combine Plant imeni K. Ye. Voroshilov, of Leningrad's associations and enterprises and of other enterprises, which have implemented the certification and efficient use of the work places, has completely confirmed the importance of these measures.

It is necessary to study carefully the achievements in the field of new production techniques, technology and organization, the quality of the goods produced, and to determine the feasibility and the advisability of their use in each production association (enterprise). The retooling plans should include, first and foremost, measures which will ensure the acceleration of the rates for the replacement of obsolete basic assets and technologies with new and advanced ones. This assumes a systematic analysis of the achievements both on a worldwide basis and within the country, as well as the improvement of the system of information about the current and impending introduction of new techniques and advanced technology.

At the same time, it is necessary to ensure the broad scale of the introduction of new techniques. Indeed, very many developments are used on an individual scale, which only creates the appearance of progress. Achieving a basic breakthrough in this matter is possible only on the basis of the energetic and engaging efforts of scientists and production workers, of the common actions and the general decisions of all the interested parties.

The raising of the technical knowledge of the personnel, both the engineering and technical workers and the line workers, takes on paramount importance.



Scientific and technical progress confronts a person with new tasks. He should not only be able to create new techniques, but also to use them efficiently in fact, and this requires a new level of knowledge, business skills, professional mastery and a range of creative initiative.

THE REALIZATION OF THE SUGGESTION MADE ABOVE WILL PROMOTE THE MORE INTENSIVE RETOOLING OF ASSOCIATIONS AND ENTERPRISES.

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## MAJOR CROP PROGRESS, WEATHER REPORTS

### 1987 UKRAINIAN GRAIN CROP CONDITIONS

Kiev SILSKI VISTI in Ukrainian 14 Feb 87 p 2

[Article by V.Krut, Chief Deputy for the Presidium of the Southern Division of Vaskhnil, doctor of agricultural sciences, under the rubric "Grain Production --The Main Concern": "Grain Fields in Springtime"; first paragraph is source introduction]

[Text] In December 1986, the Ukrainian CP Central Committee resolved to increase grain production by fully utilizing all existing potential, scientific achievements and progressive experience, and move towards solving this difficult problem affecting all workers of the republic's agro-industrial complex.

The situation regarding grain farms is rather tense. Winter crops have not been adequately sown, development has been poor and resowing may be needed in a significant number of areas. Compared with previous calculations, spring grain areas (as well as the volume of spring field work) have been extended by 3.5 million hectares. Spring soil moisture content in a number of steppe regions and forest-steppes is estimated to be lower than the annual average. Therefore, in order to fulfill grain production plans, it is imperative that each individual farm implement a complex of scientific-organizational and agrotechnical methods, and employ wide-scale intensive technology that would generate no less than 31-32 centners of premium grain per hectare from a single crop field.

Taking into account the conditions of winter crops and moisture content, each farm must be responsible for correctly defining the structure of grain areas, bearing in mind the need to extend areas under crops with high-yield, drought-resistant grains. Scientific studies show that in most of the regions throughout the steppe and forest-steppe zones of the republic, corn accounts for higher yields than any other crop; for this reason it should receive greater consideration among the spring grains, but, of course, within limits of crop rotation and with regard to organizational-technical farm potential. In the southern steppe regions with average annual precipitation of 350-380 millimeters, barley is noted for its stable yields; in more humid forest-steppe zones--barley and peas.

Taking into account concrete conditions of individual farms approved for cultivation in extending spring grain areas, it is important to keep in mind

the amount of water consumption and degree of soil moisture content for each specific area. According to data obtained from the All-Union Scientific-Research Institute of Corn, barley requires 90 percent total moisture consumption for the months April-June in preparing for harvest. Therefore, its plants are capable of producing high yields, if we take into consideration spring moisture content; moreover, if the soil moisture content measures 130-140 millimeters at a depth of one meter, it is wise to sow only barley. Corn, on the other hand, more effectively utilizes precipitation occurring in the latter part of summer; and so to extend acreage under corn it is important to comply with conditions of inadequate soil moisture content (80-100 millimeters), which will occur this year throughout the steppe zones as well as in some individual forest-steppe regions. In connection with the extension of spring crop areas and the reduction of winter crops, spring crops need to be distributed in a way that will not seriously alter the structure of predecessor crops for 1988. So in links of rotation crops, winter crops should follow sugar beets; and then winter crops should be rotated or supplemented with barley. But links of corn should be rotated with feed corn. The best winter grains to sow following stubble predecessor crops are either corn or peas.

As was noted at the December 1986 Plenum of the Ukrainian CP Central Committee, the most important factor towards the further development of grain production in the republic is wide-scale implementation of intensive technology. Scientific research has led to the general conclusion that even under arid conditions in the steppe regions the last two years, owing to the incorporation of intensive technology, winter wheat yields have increased by 5-6 centners; barley, by 3-4 centners. Even forest-steppe and woodland areas have seen a significant increase in yields.

The implementation of intensive technology requires not only additional material expenditures in the way of mineral fertilizers and control measures, but more importantly creative approaches, highly-skilled professional agronomists, machine operators, and everyone who is involved in the process of grain production. They hope for the expected pay back only in the framework of a well-founded, scientific system of agricultural practices and further envision the effective utilization of all intensification factors.

Collective and state farm specialists, taking into account this year's conditions, should be prepared to give increasing consideration to the care of winter crops and the growing of cereal grains and corn. Poorly developed crop areas must be treated with nitrogen, which is to be applied to the thawing ground with the use of airplanes. This practice will significantly improve spring growth conditions as well as enhance plant development. After regrowth vegetation has been fully replenished, bushing winter crops are treated with liberal amounts of fertilizer, implementing local ground methods at a depth of 5-6 centimeters.

In spite of the obvious difficulties involved, the entire spring grain area must be sown with first-class, calibrated, disinfected seed of regionized varieties. Without additional expenditures this will increase yields by 2-3 centners per hectare.

In the cultivation of cereals and corn, under conditions of insufficient moisture, a significant amount is obtained by incorporation moisture-retention technology during the tillage of soil. We expect to see either a reduction or combination of technological operations; the change from deep tilling to shallow; and implementation of wide-wedge combination units. Generally tilling the land just prior to sowing should result in the formation of tiny clods of earth leveled at the proper sowing depth, which would--depending on moistening conditions--ensure uniform sowing at optimal depth. In addition, plowing must be done on time, especially when the soil is physically fertile, incorporating equipment with sweep-type of operating units; this is less likely to jumble the soil and cause it to dry out.

Prior to the resowing of thinning winter crop fields the soil is plowed with the following anti-erosion cultivators: KPE-3.8, KRH-3.6. However, under arid conditions barley is sown without previous tilling.

With the aim of increasing the productivity and drought-resistance of spring cereals, it is important to effectively utilize mineral fertilizers, taking into account their reactions in light of treatment. We know that barley accounts for the highest increase in yields, owing to fertilizers (8-10 centners per hectare); for that reason the entire crop field is treated prior to sowing as well as during sowing (applied to rows) in the following manner: doses of 45-60 kilograms of nitrogen and phosphorus, along with 30-40 kilograms of potassium. In an effort to conserve moisture--we make this exception--fertilizers can be applied from airplanes; then follows the turning over of soil during the process of pre-sowing tillage.

During the sowing of barley and oats, there is no more than a 2-3 day lapse, since each day wasted means a harvest shortfall of 0.8-1.2 centners per hectare. Plant growth should be optimal, but under conditions of inadequate moisture, there is a reduction by 8-10 percent. This requires the implementation of an important agrotechnical practice--post-sowing rolling.

This year there are a number of significant prerequisites for obtaining a gross corn yield in the amount of 10 million tons. In accordance with efforts to extend acreage under corn, it is imperative that we bring into proper correlation hybrids of various maturation groups. This should be done on each individual farm, not just in each zone. To these generally accepted recommendations, steppe zone areas (due to a deficit of spring moisture), should be extended with average-early and average-ripening hybrids: "Pioner 3978"; "Dneprovsky 273"; "Krasnodarsky 440"; "Odessky 310"; "Dneprovsky 505"; and others noted for high drought-resistance.

In effort to increase feed resources, a portion of the crop area should be designated for the growing of corn for silage, incorporating appropriate grain technology and harvesting no earlier than the beginning of the wax phase of development. This makes the silage 25-30 percent more nutritious and reduces the amount of grain to be used for forage. In regard to areas under crop rotation, where winter crops follow corn for silage, quick-ripening hybrids are then sown next--these are characterized as having high maturation tendencies during the latter part of August.

This year on irrigated lands throughout the southern part of the republic we need to establish a zone that would guarantee stable grain production. Above all, we must take into account the need to extend acreage under corn by 320,000-340,000 hectares. Because of a deficit of natural moisture, the watering season will have to begin 10-12 days earlier. The water will be utilized not only for the irrigation of winter crops and perennial grasses, but even for irrigated areas under corn prior to sowing. Reserved in basins, the water will also be used to irrigate companion fields. The area can be extended by another 250,000-300,000 hectares; this means an additional harvest of 160,000-180,000 tons of grain and 250,000-300,000 tons of feed units.

The drought during the latter half of 1986 significantly hindered development of annual seed and vegetative shoots of perennial weeds. Likewise, the battle against weeds did not prove highly effective on either winter crop fields or during the process of fall plowing of winter fallow. Consequently, in the spring of this year 1987, we will have to confront a significant number of weeds in grain-sown areas. All winter wheat crops in addition to barley must be treated with herbicides prior to the shoot phase of development. Corn growing for the most part requires that the herbicides ALEROX and ERADIKAN be applied to the soil, and when absolutely necessary, the following back-up herbicides should be used: OLEOHEZAPRIM and MAYAZIN.

In accordance with the demands of intensive technology, we should employ all available control measures against pests and diseases in areas under grains. Similarly, special control measures should be implemented against root rot, rust, Septoria, grain ash, and the chinch bug.

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## MAJOR CROP PROGRESS, WEATHER REPORTS

### ORCHARDS, VINEYARDS IMPERILED BY WEATHER CONDITIONS

#### Effects on Orchards

Kiev SILSKI VISTI in Ukrainian 27 Jan 87 p 2

[Article by M. Tsupenko, director for the Department of Agrometeorology of the Ukrainian Hydrometeocenter; I. Sheremet, senior scientific co-worker for the Department of Agrotechnics of the Ukrainian NDI [Scientific-Research Institute] of Fruit Production; V. Vasyuta, co-ordinating director of the Ukrainian NDI of Fruit Production for Scientific work; M. Solovyova, chief director for the Department of Physiology and Winter-Hardiness at the Ukrainian NDI of Fruit Production, doctor of biological sciences, professor, under the rubric "Timely Advice"; "Winter Orchard Care"]

[Text] Weather conditions for summer and fall of last year proved unfavorable throughout many of the regions of the republic, as far as preparing fruit trees for the winter season. Drought stress caused poor photosynthesis, a deficit of essential nutrients, acceleration in the differentiation of fruit buds, and a decrease in frost-resistance.

Fruit production in the republic has been threatened because of the severe winter. During the first part of January, temperatures fell below the critical level for many of the different varieties of fruit trees, especially the stone-type.

During the winter period, critical temperatures affecting above-ground parts of all varieties of trees range from -23 and -24 degrees to -42 degrees and lower. Winter-hardy apple trees can withstand temperatures of -40 to -42 degrees and lower; (sour) cherry trees from -35 to -36 degrees (with drastic changes in temperature, -28 to -30 degrees). The critical temperature for (sweet) cherry trees is -30 to -32 degrees; apricots, -23 to -24 degrees. New varieties of apricots developed at the breeding station of the Ukrainian NDI of Fruit Production possess fruit buds 4-6 degrees more frost-resistant than the main regionized variety "chervonoschoky." Fruit buds of peach trees are completely destroyed at temperatures of -22 to -26 degrees.

For the first 10-day period of January, some varieties were badly damaged in a number of areas in Kiev, Chernigov, and Sumy oblasts, as well as in individual rayons in Volyn, Voroshilovgrad, Kharkov, Cherkassy, and Lvov oblasts. There was no substantial damage to fruit buds of apple trees and pear trees, as compared to the likely damage caused by sunscald to trunks and main branches.

In the northern and central oblasts (primarily in the Kiev Oblast), the fruit buds of peach trees were badly damaged. Likewise, fruit buds of the apricot variety "chervonoshchoky" sustained serious injury, but of the new selectionist varieties, 7 to 31 percent of the trees suffered no damage.

In Vinnitsa Oblast, sweet cherry trees of the varieties "yantarna," "Valeriy Chlakov," and "Hedelfingen" were all badly damaged; and, to a lesser degree, sour cherry trees. Injury to plums ("Hanna Shpet"; "renklod Altana"; "uhorka zvychayna"; and "voloshka") stood at 50 to 90 percent.

In the Crimean, Kherson, Nikolaev, and Odessa oblasts, fruit trees were not imperiled. In the southern rayons of Kirovograd, Dnepropetrovsk, and Donechin, temperatures did not fall below -20 to -25 degrees and so did not reach the critical level.

Taking into account the fact that low temperatures have had a negative effect on the wintering capabilities of the different species and varieties of fruit trees, it is absolutely essential that all farms carry out orchard inspections with the aim of determining the degree of injury from frost and then implementing a system of agrotechnical control measures.

In addition, workers are selecting a number of 3-4-year-old twigs from 4-5 trees of every variety (from the upper, middle, and lower parts) with the stipulation that these sections contain no less than 100 fruit buds of the stone variety and 20-30 buds of the pome. After 5-7 days the twigs will be analyzed to determine the degree of injury to fruit buds: for pear and apple trees tiny flower rings and other fruiting formations are analyzed; for stone varieties--budding twigs and last year's growth. The condition of the buds is determined by making cross-cuts (which is done with a sharp grafting knife or razor blade). If the young flowers have been damaged, they will exhibit a dark-brown or almost black coloration. Healthy flowers will be light green; in pears they will be white and covered with light yellow capillaries. This type of analysis is repeated during future occurrences of cold weather.

To ensure maximum preservation of fruit buds, we must remember to prune branches of frost-damaged peach, apricot, sweet cherry, plum, sour cherry, and pear trees during the bud expansion period, not in the winter. Furthermore, it is recommended that poor frost-resistant varieties of apple trees, characterized by fall-winter maturation dates, not be pruned during freezing temperatures.

The trunks of young trees which were not wrapped in the fall should have this done immediately in all areas of the republic. In sunny weather with freezing temperatures this will protect the trees from sunscald. It is not necessary to use transparent polyethelene plastic.

In those places where fruit trees have been injured by frost, it is wise to prepare a blue vitriol and lime mixture to be used for spring "holuboho" spraying so as to prevent diseases. Also beneficial for treating injuries to the trunk and main branches is orchard tar.



Snow retention should be observed on every farm, since this increases the soil moisture content. However, it is not recommended that the snow be scooped up around the trunks of the fruit trees, since this tends to make the snow cover between rows shallower; this would increase the root system's vulnerability to freezing temperatures.

In places where 1-year-old twigs have been preserved, budding sticks should be prepared for the purpose of grafting and regrafting, which is to be carried out in early spring.

#### Effects on Vineyards

Kiev SILSKI VISTI in Ukrainian 3 Feb 87 p 1

[Article by A. Gulchak, director of the Ukrainian NDI of Grape and Wine Production imeni V. Ye. Tayirov, under the rubric "Timely Advice": "How To Care for Vineyards"]

[Text] In the southern part of the Ukraine, dry weather prevailed during the latter parts of summer and fall of last year. In the beginning of December, productive soil moisture content at a depth of one meter stood at 40-80 millimeters, or 60-74 percent field water capacity. As a result, grape shoots did not mature properly.

By determining the fruit-bearing capacities of the buds of different varieties of grapes, we learn that the development of the vines has been normal. On the average, each bud [eye] contains between 1.14-2.02 racemes; this means that we can expect to see a plentiful harvest. In vineyards of the left bank Dnieper Lowland (Kherson Oblast), where in years past bitter frost has severely damaged, not only roots but also portions of the above-ground vines, the fruit-bearing capacity of the buds stands at only 0.1-0.3 racemes.

Prompt inspections of vineyards in Odessa, Nikolayev, and Kherson oblasts to determine the degree of winter injury to the shrubs after the January frosts showed that up to 50 percent of the central buds had been damaged in most table and industrial varieties of grapes grown on root stocks; the tissue of the shoots, however, was not damaged. In these vineyards, it is important to organize the general cutting and pruning of green shoots, thereby increasing the propagation of the vines in accordance with the number of injured buds.

During controlled inspections of the fields, it was discovered that the degree of damage in various rayons and even on one of the farms was not uniform. This is due above all to the biological individualism of the different varieties; the micro-climatic conditions of each sector of land; and the level of agrotechnics. It is also important to determine the degree of injury to the buds of various shrubs for each sector of land on both collective and state farms. A system of pruning and propagation of vines is selected on the basis of the nature and degree of injury.

Conditions being what they are this year, we should expect to see the propagation of 110,000-130,000 healthy buds per hectare on vineyards with normal annual growth. In addition, only fruit-bearing canes should be retained, and

the longer ones pruned away. In every concrete instance, the length of fruit-bearing canes must be determined precisely on the basis of the nature of winter injury and the layering of budding vines according to the length of the shoot.

It is significant to remember that after frost injury to vines the year before last, efforts to renew the structural forms and some of the fruiting links of various plantations were not entirely successful. Therefore, in wide-spaced and tall-stem vineyards (nourishment area 3-3.5 by 1.5-2 meters) we must form 8-12 fruiting links on the shoulders of the border. In irrigated sectors of land we must form a rectangular block with the aim of lining its borders with vines--from this we create 12-14 fruiting links.

We must give increasing attention to the regrowth of vineyards occurring on sandy soil on the left bank of the Dnieper Lowland. Fields here have been severely imperiled by frosts for the third consecutive year. And this year either part or all of the central buds of individual table varieties of grapes were killed by frost. One-year-old shoot tissue was also partially damaged. We have an analogous situation regarding industrial varieties of grapes. Pruning and propagation methods should produce accelerated regrowth of tall-stem forms and greater growth of the vines.

To ensure a good harvest of grapes, we must take into consideration the soil moisture content obtained from winter precipitation. Snow retention practices should be observed on all vineyards, employing methods for regulating the discharge.

When vines become heavily infected with mites or become pathogenic, after pruning (especially prior to the bud expansion period), all vineyards should be treated with preparation DNOK (25 kilograms per hectare) or with nitrogen (35 kilograms per hectare).

The productiveness of the shoots can be increased by employing a combination of liquid fertilizers in early spring--nitrogen, phosphorus, and potassium (in doses of 30 kilograms per hectare).

Specialists of the regional agro-industrial association, along with scientists, should be responsible for organizing seminars and providing concrete recommendations regarding the pruning and propagation of vines. Moreover, we can expect to see an increase in the volume of work, such as the tying of canes, pruning of shoots, and implementation of various control measures.

Increasing attention should be given towards the organization of work and financial rewards for vine-growers. As experience has shown, the most effective of its forms is collective purchasing but then allowing growers to tend plantations individually. It is imperative that we accomplish the following: draw up contracts with the workers; prepare technological maps; and figure out a stable lump wage payment for a single unit of production.

In planning to use money as an incentive, we have to estimate the additional cost of awarding premiums for high-quality work in the areas of pruning, propagation, and formation of vines, but taking into account the degree of injury.

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## REGIONAL DEVELOPMENT

### REPORT ON UKRAINIAN GOSAGROPROM CONFERENCE IN POLTAVA

Kiev SILSKI VISTI in Ukrainian 23 Dec 86 p 1

[Article by L. Kosychenko, SILSKI VISTI correspondent]

[Text] Further discussions were held on the implementation of intensive agrotechnology and updating of the economic mechanisms at collective and state farms in an economic conference held in Poltava, which was organized by the Ukrainian SSR Gosagroprom. The participants included secretaries of party executive committees and the heads and specialists of the agricultural industry from seven chernozem oblasts, as well as scientists. The conference was addressed by the first deputy head of the Ukrainian SSR Gosagroprom V.P. Sytnyk.

I.O. Mozhovyy, member of the Politburo and secretary of the Central Committee of the communist party of the Ukraine, was also an active participant in the conference.

The speeches and discussions dealt with the most important and urgent missions of the administration of the agricultural industry and the responsibilities of the heads and specialists of collective and state farms that are designed to implement the resolutions of the CC CPSU entitled "Immediate Measures for Improving Labor Productivity in Agriculture through Rational Work Structuring and Cost Accounting", and the decisions of the December 1986 Plenum of the CC of the UkSSR CP concerning improvements in grain production in Ukraine.

Intensive expansion of grain production, as was noted at the conference, remains the most important problem facing the oblast-level agricultural enterprises, RAPO, and the heads and specialists of farms and scientific institutions. Introduction of intensive agrotechnical methods for winter wheat this year resulted in a harvest gain of 13.4 quintals per hectare in Ukraine. In the Kiev Oblast intensive sowing yielded a gain of 15.5 quintals over conventional cultivation.

Corn fields subjected to the new technology yielded a harvest of 10.1 quintals per hectare more than conventional fields. The gain was even greater in the Cherkassy region: 16.7 quintals per hectare.

The conference provided many examples of the success with the new technology.

Collective and state farms in the Khrystinov Rayon of Cherkassy Oblast and in the Bershad Rayon of Vinnitsya Oblast were remarkable for getting more than 50 quintals of winter wheat per rotation. Individual farms did even better. Workers at the "Chervonnyy Prapor" collective farm in the Vasilkov Rayon of Kiev Oblast harvested 57 quintals per rotation on a 1046 hectare field.

However, it is possible to learn by means other than examples. Considerable information may be acquired by an analysis of mistakes and errors. Why, for example, did the new technology for winter wheat fail at the "Rakyty" state farm in the Romen Rayon of Sumy Oblast where the yield was only 22 quintals, and 24.8 quintals at the "Lypovodolynskyy" state farm in the same rayon? Such harvest are low even for farms adhering to conventional technology.

It is a good thing that these facts did not escape the notice of the specialists of the Gosagroprom. Detailed analysis demonstrated that the new technology and resources by themselves do not assure success if the chief agronomist at a farm is not fully familiar with every detail of the operation. This was the case at the farms used in the examples where the elementary guidelines were ignored and the new technology was doomed to failure from the start.

Such shortcomings and noncompliance with the technical requirements is particularly to be avoided on corn fields. It is generally assumed that in Ukraine all of the corn for grain is cultivated according to the new technology. However, in all to many cases the adherence to the new technology is not complete. It has been reported that in 1986 corn has been cultivated according to the new technology in the Kharkov Oblast on 152 thousand hectares. All of the fields were treated with expensive herbicides. However, at half of the fields harrowing was conducted before and after sprouting, and twice inter-row tillering was performed. As a result the effectiveness of the herbicides was compromised and weeds developed at some fields. In addition, sowing was conducted late this year as it was in previous years: by the fifth of May only half of the corn fields had been covered. Consequently, the corn harvest was significantly below the expected.

The participants also showed considerable interest in the reasons for shortfalls in the harvests of sugar beets, sunflower seeds, potatoes and vegetables. A comparative analysis has revealed that not all of the agronomical specialists are familiar with the technology of producing high harvests of these crops; even fewer put their knowledge into practice. The experience of the sugar beet growers in the Vasilkov Rayon of the Kiev region bears studying: using the new intensive technology they produced about 383 quintals over an area of 8.3 thousand hectares. It is also important to appreciate why in the Sumy Oblast only 226 quintals per hectare were harvested, almost 50 quintals less than in the adjacent Chernigov Oblast. The reasons were simple. At 32% of the sugar beet fields organic fertilizers were not used in the Sumy Oblast. Each hectare subjected to deep plowing was underfertilized by 56 kilograms of mineral fertilizers in the active form. Sowing was delayed. The plant density per hectare was only 92 thousand rather than the optimal 116-120 thousand. Harvesting was also untimely, resulting in a loss of 25-30 quintals per hectare.

Animal husbandry was subjected to a detailed analysis, although the statistical indicators looked good since in 1986 a significant quantity of milk, meat, eggs



and wool was sold to the State in excess of the quota. However, these were statistics for Ukraine as a whole. In a significant number of farms in the forest-steppe zone production of cattle and poultry continues to be low. Only in the Cherkassy region did milk production run around 3000 kilograms per cow. For many years now the milk production per cow stood below 2500 kilograms in the collective and state farms in the Chernigov, Kharkov, Sumy and Vinnitsya oblasts. The milk production is below 2000 kilograms at 924 farms in these areas. In the Chernigov Oblast 41% of the farms fall into that category.

The situation is particularly difficult in hog breeding, with the current increase in pork production occurring on extensive grounds. In the previous Five Year Plan, in comparison with 1971-1975, annual pork production decreased by 16%. Expenditures of feed for one quintal in gain exceed ten quintals of feed units.

Milk and meat are expensive because, in distinction to crop farming, intensive productive technology is being introduced into animal husbandry at a slow pace. This is largely due to inadequate feed supplies, inadequate reproduction and breeding programs, and poor animal husbandry practice in general.

Only inertia and lack of creativity can account for the fact that the technology in milk and meat production that has passed the test of time has not been implemented by the farm specialists on a wide scale. In the beet growing oblasts veal production should be concentrated in special farms and at complexes where heifers are maintained from the age of 20-30 days until a weight of 330-350 kilograms is reached. At many interfarm enterprises fattening on beet pulp and other feeds increases the weight to 400-450 kilograms. This practice is especially widespread in the Cherkassy Oblast. It has received approval from the CC UkSSR CP and has been recommended for use at all veal producing enterprises. However, in the Chernigov Oblast only nine special collective farms utilize this approach, and in the Poltava Oblast only four.

What can be done to improve productivity? The participants were unanimous in agreeing that only collective accounting and cost-effectiveness criteria can improve the situation and increase labor productivity.

Today, virtually all productive subunits of a collective or state farm have been put on an intrafarm cost accounting basis in Ukraine. In 53% of the farms a check form of accounting is used to monitor mutual transactions.

A collective contracting basis for the individual farm subunits is now in force at 73% of the farms in Ukraine, with the system spreading to the family and individual level. The advantages of this form of cost accounting at farms are obvious.

Nevertheless, the conference participants noted with justifiable self-criticism that the introduction of progressive forms of management and stimulation of labor productivity often remains at a low level, due to excessive formalism and noncompliance with recommendations and regulations.

The conference in Poltava was unique in lacking stirring slogans and loud

proclamations of accomplishments. The conference was to the point and concentrated on combining new technology with collective contracting and cost-accounting.

The participants showed considerable interest in the work of the "Ivanenko" collective farm in the Mirgorod Rayon, and in the "Chervona Zirka" and "Leninsky Shlyakh" collective farms in the Khorol Rayon; they also visited processing and food enterprises in the Poltava region.

Also participating in the conference were the first secretary of the Poltava Oblast Party Committee F.T. Morhun, section chief of the Department of Agriculture and Food Industry of the CC CPSU M.M. Kovalenko, and leading members of the Central Committee of the Communist Party of Ukraine and of the Council of Ministers of the Ukrainian SSR.

12172

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## TILLING, CROPPING TECHNOLOGY

### INTENSIVE TECHNOLOGY, WINTER GRAINS IN PARTS OF UKRAINE

Kiev SILSKI VISTI in Ukrainian 7 Jan 87 p 2

[Article by M. Ilchenko, candidate of agricultural sciences, acting head, Department of Strain Agrotechnology, Myronivka Scientific Research Institute of Wheat Breeding and Seed Science imeni V.M. Remeslo]

[Text] The key to increasing grain harvests lies in implementation of advanced agrotechnology. This approach has been confirmed in the production of winter wheat in the Right-Bank region of the Ukrainian forest-steppe. Almost one million hectares have been accorded to this crop in that area. The yields of fields on which the new technology has been practiced were 11.2 to 15.5% greater than for fields that did not benefit from such advances.

Farms in the Kiev region produced 41.2 centners per hectare from each of the 200.6 thousand hectares. Even better harvests were obtained by farmers in the Cherkassy, Khmelnytskyi and Ternopol regions. Harvests of 50 centners were achieved by the farmers in the Khristinov Rayon of Cherkassy Oblast, in the Volochysk and Chemeriv rayons of Khmelnytskyi Oblast, in the Khustskiy, Zbarazh, (Ridvolochyske) and Chortkovskiy rayons of Ternopol Oblast, in the Brody Rayon of Lvov Oblast, and in the Dubenskiy and Rovenskiy rayons of Rovno Oblast.

The achievements in the Chemerovetskiy Rayon of Khmelnytskyi Oblast were especially remarkable. Each of the ten thousand intensively cultivated hectares yielded 55.2 centners of grain.

Intensive technology has been shown effective in securing high yields of wheat. Protection of the winter grain from adverse environmental conditions and selective use of nitrogen fertilizers in the Cherkasy region has provided a production figure of 203 thousand tons of grain, as well as 60 thousand tons in the Kiev region and 149 thousand tons in the Vinnitsa region.

Nevertheless, at many farms the average wheat harvest was less than 30 centners. In many cases this was due to neglect of appropriate technology.

Among the agrotechnological factors that may adversely impact harvests are low seed quality, improper crop rotation, poor soil management,



disregard of proper sowing time, and improper planting depth. Other factors include ineffective prevention of wheat diseases and protection from pests and weed control.

The low harvests and sowing characteristics of the seeds were due to runoff because of unusually high precipitation in June and July of 1985, as well as to considerable seed damage. A study conducted by the Myronivka Institute has shown that 56% of all the wheat seed had been damaged, on the average, at all the farms of six rayons in the Kiev region; in addition, 20 to 80% of the seeds showed deviation from the accepted norms. At many farms the seeds obtained from seed plants were stored for prolonged periods of time under high humidity, further leading to deterioration of seed quality. Furthermore, treatment of the seeds with agents such as baytan [sic] and granozan [sic] at many farms also contributed to low harvests. Under field conditions only 25% of the seeds treated with baytan and subjected to damage undergo germination, while with granozan the figure is only 5%. Other farms, however, properly treated the seeds either with fundozol [sic] or vitovaks [sic], agents that have no effect on germination.

The majority of agronomical services planted winter wheat after grass stands, peas, silage corn, and fodder plants in accordance with standing recommendations. However, on over 9% of the sown area winter wheat was cultivated after stubble plants. At some farms in the Kiev, Vinnytsya and Khmelnytskyi oblasts wheat followed sugar beets. After the sugar beet crops and late corn harvests the spring crops of wheat were poor.

In recent years many farms have been slow in clearing fields off silage corn due to separate harvesting of stalks for silage and the corncobs for the production of feed concentrates. This practice delays soil preparation for winter wheat and has an adverse effect on the subsequent wheat harvest. The solution to this problem is being offered by new technology which calls for early corn sowing to shallow depths. Experience at the "50 Rokiv Zhovtnya", "Ukrayina" and other farms in the Vasylkovskiy Rayon of the Kiev Oblast has shown that this new technology allows corn harvesting ten days earlier than commonly practiced, without any adverse effects on the quality and quantity of silage corn.

However, in the 1985 vegetative period there were cases in which perennial grasses were mowed not once, but twice or three times; subsequently, the fields were prepared for fall sowing. Such practice reduced the value of the perennial grasses since they removed more soil moisture than did the stubble plants. At the end of the wheat vegetative phase following two grass mowings the crop was inferior to that obtained after pea crops. Such crops were encountered at the farms of the Kiev, Vinnitsa, Khmelnytskyi and other oblasts.

Timely and appropriate soil treatment is one of the most important factors in assuring the proper conditions for plant growth and development. The correct soil management program ensures moisture retention, improves the phytosanitary status of the fields, and favors mineralization of organic matter and intensification of microbial processes.

Observations conducted by specialists from the Myronivka Institute found that in the latter third part of August, 1985, only a third of the fields was ready for sowing. Such fields had been adequately prepared and cleared of pea crops. In the case of other predecessor crops the soil clumps were not broken up, the fields were not leveled, and packing was neglected, resulting in significant losses of moisture. This was the situation at the majority of the farms in the rayons of the Vinnitsya and Zhitomir oblasts, where wheat was sown on unprepared clotty fields. Only at the farms of the Bershadskiy Rayon in the Vinnitsa Oblast were the fields properly prepared after late crops. Last year this rayon provided the largest harvest in Vinnitsa Oblast.

Winter wheat sowing is generally started when the average temperature drops to 15°C. In the Mironovka region this generally occurs around September 10, but in 1985 this temperature drop was observed on September 6. This fall sowing was delayed because of a very dry soil conditions, and subsequently because of heavy precipitation (70% of the normal monthly precipitation fell between September 5 and 15). As a result, sowing was conducted late in the year. At 18% of the sown fields tillering did not occur when the vegetative phase reached its end, with the decision to either thicken the crops or sow over with barley.

The new technology requires that seeds be sown only to a depth of 3-4 cm. However, at many farms the seeds were sown much deeper leading to a low crop density at farms in the Mironovka, Kagarlykskiy and Boguslavskiy rayons in the Kiev Oblast, in the Nemirovskiy and Naysinskiy rayons in Vinnitsa Oblast, and in the Lyubarskiy and Ruzhinskiy rayons of Zhitomir Oblast.

In order to ensure that the winter crops received a full complement of nutrients, some specialists recommend that a portion of the mineral fertilizers, especially phosphorus and potassium, be withheld from sugar beets, potatoes, and other crops. However, these have been shown to be erroneous views since it has been demonstrated experimentally that depot levels of phosphorus-potassium fertilizers adequate for 3-4 years corresponds to annual addition in the recommended concentrations.

Low harvests have also been due to inappropriate use of chemical plant protectors. Wheat damage due to various stem-damaging insects may be avoided by timely treatment of the seeds with insecticides. At the Budennyi collective farm in the Myronivka Rayon of the Kiev Oblast wheat was sprayed in the 1-2 leaf phase. This procedure reduced the damage to 1-2%.

Inappropriate mice control measures led to a marked increase in the mice colonies on winter wheat fields. At some farms of the Charkasy, Kiev and other oblasts the rodent count reached 50-80 per hectare.

Some specialists employ chemical plant protectors without regard for the biology of the crops and the properties of the agents. However, winter crops at various stages of development are susceptible to the herbicides 2,4-D and 2M-4-C. High doses of the herbicides lead to leaf deformation and twisting, with the same changes seen in the stem and ears. The optimum time for 2,4-D and 2M-4-C application in the case of winter wheat is at the time of full tillering

in Spring. The use of 2,4-D in Autumn and in late Spring at some of the farms in the Myronivka and Kagarlykskiy rayons of the Kiev Oblast, in the Novohrad-Volynskiy Rayon of the Zhitomir Oblast, and in the Korsun-Shevchenko Rayon of the Cherkassy Oblast, resulted in fusion of the two topmost leaves, deformation of the stem and the ear, and partial sterilization of the flowers. These factors accounted for a significant crop loss. The Myronivka Scientific Research Institute has found that the use of herbicides in the Spring during active wheat growth reduces the harvest by 28-41%.

It is important that the experience of the past year dealing with the use of the intensive agrotechnology for cultivation of winter wheat receive the widest attention at the education seminars now being held for agricultural workers this winter. This should be a high priority item in order to avoid the mistakes of the past.

12172

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## LABOR

### FORMER WAGE OFFICIAL ON MODIFICATIONS OF BONUS SYSTEM

Moscow SOTSIALISTICHESKIY TRUD in Russian No 1, Jan 87 pp 53-61

[Article by V. Rakoti, candidate of economic sciences, formerly deputy chief of the wages department of USSR Goskomtrud: "Changing the Bonus System"; passages between slant lines are in bold-face type in original text]

[Text] In 1985 almost 33 billion rubles were spent in the country's economy to pay bonuses, three-fourths of that amount in leading production sectors: in industry, construction, in transportation and communications, and in agriculture. It is well known that it is very important to use such immense resources efficiently and commit them above all to incentives for fulfillment of contract obligations concerning product deliveries, for improvement of product quality and reduction of production costs, for the rise of labor productivity, and for conservation of physical resources of all kinds. It should be borne in mind in this connection that a fourth of the growth of the average wage is being achieved by virtue of the growth of bonus payments.

There will be one important feature in the way the bonus system is organized in the current 5-year planning period. This is that the portion of bonus funds to be paid out of the wage fund and material incentive fund is committed to raising the wage rates and salaries of personnel in production sectors. This means that the effectiveness of bonuses has to be increased at the same time when smaller resources are being allocated to pay them, and that will mean a radical restructuring of the entire bonus system.

As is well known, up to now USSR Goskomtrud and the AUCCTU have approved the Basic Regulations on Awarding Bonuses. Guided by them, ministries (departments) have joined trade union authorities in approving Standard Regulations on awarding bonuses to the personnel of the sector or branch, and they in turn have served as the basis for drafting specific regulations on the awarding of bonuses to the personnel of associations, enterprises, and organizations. As of 1 January /this tier structure is abolished/. Under a decree of the CPSU Central Committee, USSR Council of Ministers, and AUCCTU on improvement of the organization of wages, the managers of associations, enterprises, and organizations in the production sectors will join trade union committees in independently drafting and approving regulations on the awarding of bonuses to workers, designers, production engineers and scientists, members of the technical inspection service, and other supervisory personnel, specialists, and employees for the principal results of economic activity in the



light of the specific conditions of production and the tasks which those subdivisions face.

As for the supervisory personnel of associations, enterprises, and organizations in industry, construction, railroad transportation and agriculture, the regulations on awarding bonuses to them are to be approved by ministries and departments of the USSR and the union republics jointly with the respective trade union authorities. The maximum bonus levels and indicators used in awarding bonuses to supervisory personnel of enterprises and organizations in the motor, marine, river, and air branches of transportation, communications, water management and forestry, geological explorations, topographic-and-geodesic, and other enterprises and organizations are to be set forth by ministries and departments jointly with trade union authorities, subject to concurrence of USSR Goskomtrud and the AUCCTU.

/The sizable broadening of the rights of work collectives in the area of organizing the payment of bonuses/ for the principal results of economic activity has become possible because the new methods of economic management have been introduced: these are the application of the improved performance indicators that are planned, formation of the wage fund and the material incentive fund as a function of these indicators and at standard rates, and the enhancement of the economic accountability of associations, enterprises, and organizations for the end results of their operation.

Rights have also been greatly broadened in the application of special bonuses. They have been granted the right to set up the unified material incentive fund to which all resources in the special systems would be credited and to independently determine the levels, procedure, and intervals of payments of special bonuses. Thus, altogether new conditions are being shaped for the administration of these bonuses.

In the industrial sector alone there were about 60 separate regulations on special bonuses last year. This total can be subdivided into 10 systems which have common goals, sources, and mechanisms for awarding bonuses (Table 1).

Most of the centrally approved regulations on special bonuses (except for certain ones which stimulate acceleration of scientific-technical progress and those which provide incentives to winners in socialist competition) are terminated as of January 1987 insofar as they pertain to awarding bonuses to particular workers. Now associations, enterprises, and organizations will themselves determine the indicators used in the bonus system, the group of workers covered by these incentives, and the levels of the bonuses to be paid should they decide to set up a unified material incentive fund. Of the regulations in effect on special bonuses those remaining in effect will be those which regulate indicators for whose fulfillment bonus funds will be placed at the disposition of work collectives, and which regulate the size and sources of payments of these funds. As a matter of fact, why should incentive funds be credited, say, for the manufacturing of consumer goods from production waste be earmarked, that is, paid under a special regulation, when for the personnel employed in manufacturing them this is their principal job, and they receive bonuses for it as they do for the principal results of work? Another example.

In the context of large-scale production of products for export, when the selection of particular products for the external market is made only in finishing operations, it is not possible to effectively administer special bonuses in other operations. The situation is similar with incentive systems for new technology and processes, for manufacturing consumer goods marked "N," and so on. Experience shows that in these cases it is better to use the special incentive funds to increase the size of bonuses for the principal results of economic activity. But this requires substantially broadening the rights of work collectives, which has in fact been done.

Table 1

| <u>Special Bonus Systems in Effect</u>  | <u>Number of Regulations<br/>That Come Under Each<br/>Special System</u> |
|---|--|
| For acceleration of scientific-technical progress   | 16   |
| For delivery of products for export   | 1  |
| For improvement of product quality  | 7  |
| For delivery of particular products   | 12   |
| For attainment of rated capacity  | 3  |
| For manufacturing consumer goods from waste   | 1  |
| For collection and delivery of production waste for<br>secondary utilization  | 9  |
| For activation of construction projects, including<br>capacities which have undergone reconstruction and<br>retooling | 1  |
| For performance of paid services rendered to the<br>public  | 1  |
| According to the results of the All-Union and<br>republic socialist competition                                       | 5  |

Much attention in revamping the bonus system must be paid to improving the procedure in administering worker incentives. Success here depends in large part on the extent to which the creative initiative of this main body of work collectives is stimulated. It has been deemed necessary /to orient the awarding of bonuses to the collectives of brigades and individual workers above all for fulfillment of production (rated) assignments established on the basis of the plans of sections and shops/. At the present time one quite often observes that workers successfully overfulfill output quotas by 20-30 percent and receive bonuses, while the section or shop in which they work fails to fulfill the plan. The reason is that the level of work quotas is lagging behind the level of the plan; they are not taking into account (and the way wages are now organized, they cannot take into account) the annual rise of productivity and the improvement of the quality of work.

Nevertheless, under the present conditions for the conduct of economic activity the workers need to be motivated to fulfill the plans of the section and shop. The mechanical approach of paying workers bonuses according to the performance of the section or shop as a whole is not permissible here. This is the same thing as stimulating the collective of the particular enterprise as a function of successful performance of the branch or sector. The experience of

progressive enterprises suggests that the state plan is brought closer to the workers if they are assigned corresponding production targets or rated assignment derived from it. The main thing is that the aggregate targets of the workers correspond to the plan of the section or shop. Transferring the workers to a new bonus indicator dependent upon the requirements of maintaining the level that has been achieved, maintaining a uniform pace and doing quality work, and performing the entire range of work assigned, must not result in a reduction of bonuses.

The following method of calculating them can be recommended for this purpose. For example, if earlier a worker overfulfilled the quota by 20 percent and as a consequence received 20 percent of his piece rate in the form of a bonus (1 percent of the wage for each percentage point of overfulfillment), then under the new conditions a 20-percent overfulfillment of the quota and an additional 5 percent taken from the plan of the section would be set forth as a production assignment. It would have to be unfailingly fulfilled to obtain a bonus amounting to 25 percent of the piece rate. Overfulfillment of the quota by 24 percent signifies failure to achieve the assigned level of output, and the worker would not be entitled to a bonus. Moreover, one of the conditions for payment of the bonus might be that the quota be overfulfilled at a level of 125 percent every day, since the uniform pace of many workers might depend in the production process on the work of a single worker.

Of course, this does not exhaust the restructuring of the worker bonus system. As the level of mechanization, automation, and robotization of production rises, timely and quality setup, adjustment, and repair of machines and equipment become more important. Bonuses can also be used to give greater motivation to workers who attend that equipment for reduction of downtime, for increasing the level of attainment of technical parameters, and for achieving the coefficient of utilization. The result of the operation of machines and equipment must be the indicator used in this bonus system. In other words, it is a question of motivating firefighters not on the basis of the fires they have put out, but on the basis of their preventive work in averting them, on the basis of the absence of fires.

The wage fund has great importance as a source of payment of bonuses to workers in all categories (Table 2).

As we see from the table, at the same time that the opinion has been created that the growth of incentive payments from the material incentive fund and special sources is unrestrainable, in some sectors bonuses from the wage fund have been increasing at a higher rate. At a time when the task has been set of creating a cost-cutting mechanism, less attention should be paid to bonuses paid from the wage fund. After all, expenditures to pay them make the production cost higher, since the bonuses from other sources are in most cases paid from a portion of the benefit obtained. That is why the maximum size of bonuses from the wage fund for workers has been retained, but it has been given a new content. If the workers are members of brigades, then the maximum size of the bonus which has been retained (as a rule, 40 percent of the wage rate or piece rate) applies to the collective of the brigade as a whole. The individual size of the bonus for each worker in the brigade is determined according



to his personal contribution to the overall results of work and is not subject to any maximum limit. This procedure affords the possibility of giving good recognition to the front ranker in production and of penalizing the slack worker. /The restriction on the maximum size of special bonuses to workers has been done away with./ In short, practically all the questions of organizing payment of these bonuses are now settled by the work collective.

Table 2

In percentage

| <u>Sphere in Which It Is Used</u> | <u>Year</u> | <u>Sources</u>   |                                |                      |
|-----------------------------------|-------------|------------------|--------------------------------|----------------------|
|                                   |             | <u>Wage Fund</u> | <u>Material Incentive Fund</u> | <u>Special Funds</u> |
| National economy                  | 1975        | 48               | 42                             | 10                   |
|                                   | 1985        | 51               | 42                             | 6                    |
| Industry                          | 1975        | 47               | 45                             | 8                    |
|                                   | 1985        | 54               | 42                             | 4                    |
| Construction organizations        | 1975        | 55               | 22                             | 23                   |
|                                   | 1985        | 55               | 28                             | 17                   |
| Railroad transportation           | 1975        | 51               | 46                             | 3                    |
|                                   | 1985        | 66               | 31                             | 3                    |
| Sovkhozes                         | 1975        | 30               | 58                             | 12                   |
|                                   | 1985        | 29               | 60                             | 11                   |

In the current 5-year planning period great importance is being attributed to conservation of physical resources. In order to give workers greater motivation in this area, they can now be awarded incentives without limits on the maximum size of the bonus for thrifty consumption of any physical resources by committing to these purposes as much as 50 percent of the saving achieved. Up to 75 percent of the saving can be used to pay bonuses for conservation of fuel and energy.

In addition, the management of an association, enterprise, or organization has been extended the right to institute in agreement with the trade union committee the aggregate recordkeeping on expenditure (saving and overexpenditure) of all forms of physical resources used by a brigade. This is a substantial correction in the present procedure, whereby records on consumption are kept for each type of resource separately, and the bonus has been paid for a saving achieved when other resources were overconsumed. The overconsumption could be offset by the saving from just one type of resource.

The source from which the bonus is paid for conservation of resources has remained in place--this is the production cost.

Substantial improvements have also been made in the procedure for awarding incentives to specialists and employees. /The transition is to be made to crediting bonuses as a rule to the collective of the structural subdivision/ (section, shop, department) as a whole. This means that the total

size of the bonus of the collective of specialists and employees may be determined in percentages of their wage fund computed on the basis of salaries in the organization chart or simply in an absolute amount. To stimulate the collective of the structural subdivision to fulfill plans (targets) with fewer personnel regardless of the causes, especially in stimulating fulfillment of particular assignments (for example, the team of designers for creating new technology or a new process), it is best not to reduce the collective bonus established earlier on the basis of time actually worked. This procedure is applicable to bonuses both for the principal results of economic activity as well as for those paid under special systems.

And then within the limits of the amount credited the collective itself will determine the size of each worker's bonus according to his personal contribution to the overall results. Slack workers may not be nominated for a bonus at all, which does not require issuing any order, but rather the decision of the collective of the structural subdivision is sufficient.

A question arises here: Is it possible for the administration to have any influence on the awarding of bonuses to a particular specialist or employee who is being awarded an incentive as part of the collective? Current legislation and practice give an affirmative answer. The manager of an association, enterprise, or organization is entitled to reduce or completely eliminate a worker's bonus which has been awarded by the collective of the structural subdivision if he is guilty of serious breaches in production. The manager has also retained the right to award a worker incentive for particular success. But this must be the exception, not the rule. In the context of the new methods of conducting economic activity the collective of the structural subdivision must be placed in conditions where it itself will be motivated to render what is due to the full extent for production breaches, since they have a direct effect on the collective bonus. In other words, the entire collective must take responsibility for the individual worker's oversights--they must pay for it through a reduction of the collective bonus; then they will not fail to be alert to every breach that is committed in the operation.

Now as never before /it is important to make the right choice of the indicators used in awarding bonuses to specialists and employees/. The point of departure here should be the tasks of the respective structural subdivisions. They vary, as is well known. It is deemed advisable to award bonuses to designers, process engineers, and scientists above all for developing and applying new technology, progressive processes, and materials that meet world achievements or surpass them, and for improvement of the quality and reliability of the product produced. Collectives of sections and shops should be oriented toward unconditional fulfillment of the production program for all indicators, but inspectors solely toward improvement of product quality.

The collectives of functional subdivisions (the planning and production departments, the departments of the chief power engineer or mechanic, and so on) should be motivated on the basis of the end results of the economic activity of the associations, enterprises, and organizations as a whole. This does not mean that the indicators used in awarding them bonuses must necessarily

coincide with the indicators used for awarding incentives to supervisory personnel of enterprises. The indicators for awarding bonuses to the personnel of functional divisions must reflect some sort of specific functions or aspects of economic activity. For the members of the technical department, for instance, this might be fulfillment of the plan for new technology and processes, for the labor department it might be the rise of labor productivity, for the planning department it might be the reduction of production cost or the growth of profit, and so on. In all of these cases it would be exclusively for the association, enterprise, and organization as a whole.

This is an important condition for the awarding of bonuses to the personnel of the management apparatus, which has recently been the subject of debate in connection with the widespread creation of production associations, which by and large consist of independent enterprises and organizations. In such associations particular members of the management apparatus are frequently ordered to take responsibility for individual independent enterprises and organizations. Quite often the result is this: The enterprise has fulfilled the plan, but the association has not. The result seems unfair--the results for which the worker is personally responsible are good, but he is not entitled to a bonus. Yet it is stated in the regulation on the production association that the management apparatus must be concerned with the affairs of the association as a whole. In the awarding of bonuses to specialists and employees for collective indicators of the operation of structural subdivisions, then, this question must be dealt with properly. Within the limits of the bonus amount credited to the collective of the subdivision individual workers would be paid incentives according to their personal contribution to the overall results, including the results of operation of the enterprises and organizations which are part of the association and for which they have been responsible.

It should be noted that the procedure established for awarding bonuses to workers for conservation of physical resources also extends to specialists. The specialists are no longer divided into two groups, one of which can be paid bonuses only for conservation, and the other only for reduction of costs per ruble output. The individual bonuses of specialists for conservation are not subject to maximum amounts; their size is determined by the amount of the bonus credited for conservation of particular forms of physical resources.

Beginning in the new year /the system for awarding bonuses to supervisory personnel undergoes essential change/ in the associations, enterprises, and organizations of the production sectors of the economy. Instead of centrally assigned principal indicators for awarding bonuses for these personnel (except for agriculture), the indicators will now be established annually by ministries and departments of the USSR and the union republics jointly with the respective trade union authorities (for individual sectors and branches, also in agreement with USSR Goskomtrud and the AUCCTU) on the basis of the tasks which the sectors and branches face. This makes it possible to take into account more fully the particular features of the sector with respect to work incentives, and it enhances the role and at the same time the accountability of union and republic management entities for the effectiveness of the bonuses paid out.

The principal indicator in the economic performance of a particular sector must be among the principal indicators for awarding bonuses. In the industrial sector this is the delivery of products in accordance with contracts concluded and the job orders of foreign trade organizations. At least 50 percent of the entire amount of bonuses for the principal results of economic activity would go for fulfillment of this indicator. Bonuses are paid for the volume of sales only if contractual obligations are 100-percent fulfilled. If they are not fulfilled, half of the bonuses credited for other principal indicators of operation are held up. If the underdelivery under contracts is made up by the end of the current year, the amounts of bonuses held up are paid in the full amount.

In other production sectors ministries and departments of the USSR and union republics have been ordered to join the respective trade union authorities in setting up a similar procedure for payment of bonuses for the principal results of economic activity in other production sectors. The point is that in every sector the principal indicator of the economic activity of associations, enterprises, and organizations must be identified. If it is fulfilled, at least 50 percent of the sum total of bonuses for principal economic results is paid. The same procedure as in industry must also be established when the principal indicator is not fulfilled.

There have been substantial changes in the maximum size of bonuses. For the principal results of economic activity a single general maximum of .75 of the salary has been established instead of the two limits, the ordinary and accustomed .5 of the monthly salary, and the .25 of the salary per month introduced in 1983 for reduction of costs per ruble of output. That is why in industry, for example, the maximum size of bonuses for fulfillment of product deliveries under contracts must be at least 37.5 percent of the monthly salary (.75 x 50:100) instead of 30 percent of the salary under the procedure that was previously in effect. The size of bonuses of supervisory personnel for other principal indicators may be whatever you like, but in the aggregate they must not exceed 37.5 percent of the monthly salary.

The specific size of bonuses paid to these personnel of associations, enterprises, and organizations will be determined by ministries and departments of the USSR and union republics in agreement with trade union authorities. In this connection one can recommend the experience gained during the large-scale experiment, when bonuses were awarded separately for each basic indicator; the size of the bonuses for reduction of costs per ruble of output or growth of profit were determined from a standard rate for each percentage point of improvement of these indicators.

/Standard bonus rates/ constitute an important new element in the mechanism of material incentives. Introduction of the standard rates is related to implementation of the principle of equal payment for equal improvement of operating indicators. As a matter of fact, if for every percentage point, say, of the rise of labor productivity the same equal rate (in percentages of the monthly salary) is established for all associations and enterprises in the sector, then the size of the bonus will increase in direct proportion to the increase in the number of points, which precludes the



possibility of an incentive that represents leveling when the results have been different.

Very substantial changes have been made in the procedure and size of bonuses awarded to supervisory personnel through special systems. In past years special bonus systems were quite often introduced in order to stimulate the solution of problems that had come to a head. A preferential procedure for the payment of bonuses was envisaged in many of them for supervisory personnel on whom the organizational aspect of the effort primarily depended: regardless of the basic results of operation, over and above the established limits, and in some cases even without any sort of restriction on the level. Ultimately a practice came about where the bonuses for the principal results quite often represented a miserly portion of the total amount of bonuses which a particular supervisor received for the year. This shifted the emphasis in work incentives of the supervisory category of personnel toward individual indicators which by no means determined the character of the association, enterprise, or organization. For instance, in addition to 2.5 monthly salaries for new technology and processes, for delivery of products for export, for the production of general technology, and for activation of construction projects during the year, a supervisor of an industrial enterprise might receive yet another salary for introduction of new technology and production of new goods bearing the Quality Emblem, as many as 4 monthly salaries for increasing the output of goods per ruble of wages, as much as 2 monthly salaries for production of consumer goods in the branches of heavy industry, as much as two salaries for fulfillment of the annual plan for product deliveries, as much as two salaries for fulfillment of the annual plan for new technology, bonuses with no restriction on the maximum proportion for new technology at or exceeding the world level, for increasing the relative share of high-quality products, for rendering paid services to the public, and for certain other operating results. As is evident from this enumeration, supervisory personnel had broad opportunities for obtaining bonuses under various special systems. In addition, as surveys have shown, many ministries and departments have not been adhering to the procedure for awarding bonuses under these systems--instead of breaking down the plan for the coming year by enterprises, they failed to set targets for whose fulfillment supervisory personnel might have been awarded incentives, nor did they fix the size of the bonuses for these targets.

Beginning in 1987 a single supervisor of an association, enterprise, or organization in production sectors (except agriculture) /may receive for the year bonuses not exceeding 2.6 monthly salaries/ under these special systems. The indicators and levels of bonuses under the special systems for supervisory personnel of associations, enterprises, and organizations are established by ministries and departments of the USSR and union republics jointly with trade union authorities on the basis of the tasks which the sectors and branches face.

/Over and above this level the supervisor may be awarded additional bonus up to 1.4 monthly salaries on the basis of the results of all-union and republic socialist competition./ Of course, these restrictions do not extend to Lenin Prizes, State Prizes of the USSR and union republics, bonuses of the USSR Council of Ministers, other one-time bonuses established and paid



with permission of the USSR Council of Ministers, nor bonuses of state and public organizations of the USSR and union republics.

Following the example of enterprises which previously were converted to the new economic conditions, beginning in 1987 the maximum level of bonuses is to be fixed in all production branches so as to take into account supplements and premiums. The list of supplements and premiums to be taken into account in connection with the awarding of bonuses even for the principal results has been issued by USSR Goskomtrud and the AUCCTU.

It should be noted that the maximum level of bonuses for the principal results of economic activity and under special systems established for supervisory personnel extend to specialists and employees. This procedure differs substantially from the one in effect up until the end of 1986, under which the regime for restricting the size of special bonuses for supervisory personnel was uniform for all the systems, while for specialists and employees it was different for each respective system. And to go further. It is allowed to pay special bonuses over and above the established limit of special bonuses (2.6 monthly salaries per year) for conservation of certain types of physical resources.

There is one thing that is fundamentally new in setting the maximum levels of bonuses for specialists and employees. When they are awarded collective bonuses, just as in the case of workers, there are no maximum limits on the individual bonuses. Bonuses are paid to particular workers within the limits of the size of the bonus credited to the collective of the structural subdivision in accordance with his personal contribution to the overall results. That is why there is no need to put a limit on their maximum level. Favorable conditions have been created thereby for overcoming leveling in material incentives.

When the wage fund for the association, enterprise, organization, shop, section, or other structural subdivision is overexpended, the bonuses of the respective supervisory personnel, specialists, and employees, and also designers, production engineers, and scientists for the principal results of economic activity are not reduced as much as 50 percent, as was previously the case, but will be held up for the amount of the overexpenditure that occurred. If that overexpenditure is made up in the subsequent periods of the calendar year, the amounts of bonuses held up are paid in the full amount, not at the rate of 50 percent, which was previously the case.

Thus ministries and departments, associations, enterprises, and organizations now have at their disposition an effective method of increasing the motivation of personnel of all categories to successfully fulfill plans and targets, to achieve high end results on a qualitatively new basis--full-fledged intensification of production. The task now is to make the most effective use of every bonus ruble for those purposes.

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## LABOR

### AT-HOME LABOR ACTIVITY JUSTIFIED

Moscow EKONOMICHESKAYA GAZETA in Russian No 1, Jan 87 p 14

[Article by K. Papoyan, director of the Moscow Kerchief Factory: "On a 'Home' Contract'"]

[Text] Most people usually associate at-home labor with something simplified and inefficient. That is a mistake! But we have to listen to it at various institutions where doubts still arise occasionally about whether at-home production work should be developed at all.

It certainly should be. I say this categorically; for I can see the advantages -- economic and social -- of this form of labor organization very clearly from the example of our factory.

Just 10 years ago we had no new workers coming to us. We had a small staff of at-home workers who hand-knitted woolen kerchiefs, and they had no appreciable impact on the economy of our primary production where essentially the same product was being turned out under industrial conditions. And incidentally, this is the origin of our enterprise's name, the Moscow Kerchief Factory, a name that no longer fits our production profile.

At one time we produced just 4 million rubles worth of output a year. Today we produce 17 million. I should note that the number of employees in the primary shops is unchanged -- 250. But the number of at-home workers on our staff has increased significantly. There are now more than 1,000 of them. The assortment has broadened greatly: knitted and woven scarfs, headgear, fleece open-work kerchiefs, vests, shawls, articles of children's clothing, woven chair covers, and bedspreads. All these articles, which are in great demand among consumers, are distinguished by craftsmanship and the creative imagination of our masterful women.

The labor of at-home workers is organized by individual contracts. The factory administration concludes a contract, which reflects the rights and obligations of the parties, with each worker. Specifically, the contract stipulates all the main production-economic features which the at-home worker's labor must match: output norm, technical specifications and state all-Union standards, times for turning in output, and so on.

In addition to the main production facility the factory has three branches in the Krasnogvardeyskiy and Brezhnevskiy Rayons of Moscow. We operate receiving points there. They are the centers for organizing at-home labor with defined, specific conditions. These points receive the raw material, and this is where the finished products are turned in. The factory takes care of delivering knitting and weaving machines to the workers' homes and also organizes technical servicing and repair work. Almost half of the machines that have been given over for use by at-home workers have programmed control. The machine itself designs the open-work stitch and does not require a high level of professional skills for handwork. But we do have real masters, artists whose articles are individual and very high in quality.

If the accepted worker has even the minimum knowledge and skills, we send him to the training combine of the Moscow city executive committee where the essential technical training is given. Then production engineers, artists, and equipment mechanics go through the practical lessons with them. The course of training takes no more than 30 days, and many finish it in 2-3 weeks. With a 4 or 5-hour workday the at-home worker for our factory earns an average of 100-110 rubles a month. But with a high skill level (or where working time is increased) the earnings reach 200, and sometimes even 250 rubles. And all our production is highly profitable. In 1986, for example, we received more than 1.7 million rubles of profit, which was 250,000 rubles beyond the plan assignment.

At the time when we decided to expand our production volume by taking on at-home workers we did not fully realize how efficient it would be to use their labor. The people work with great enthusiasm, and many show creative inclinations.

It is already obvious to us that at-home production work, especially in a large economic center, will have a constant supply of personnel. In these places there is always a considerable group of people who, for one reason or another, cannot participate equally with others in the labor process, either in general or for a certain time. They are pensioners, college students, invalids, and women who are caring for children. Most of them can and want to work; all you have to do is provide the necessary conditions.

Moreover, it is precisely in the large cities that we see most clearly that the criteria for choosing a job are changing, especially for women: the decisive factor sometimes is neither the amount of wages nor the position; it is closeness to the residence and rational combination of work and free time.

The development of the at-home form of labor organization is producing a great social benefit. For example, when a baby is born the mother is given one year of partially-paid leave. But the amount of pay, 35 rubles a month, is small, especially when we are speaking mostly of the budgets of young families. The young mamas who work for us have an opportunity to devote more time to the upbringing, development, and education of their little ones. Their children usually get sick less. Certainly this is an impact that deserves attention!

I want to mention the labor of invalids and pension-age people specially. Many of them find the additional material gain they receive from working within their

capabilities to be very important. Nonetheless, the main thing is that the person continues to take part in public production and feels needed, which stimulates labor and general activism.

It has been calculated that there are at least 15,000 residents of Krasnogvardeyskiy Rayon in Moscow who could participate in production work if they were offered work in the home or near the home. These 15,000 (figuring for our factory) would produce 45-50 million rubles worth of output in a year. But ... and here is where the numerous "but's" begin -- we cannot offer this opportunity to all who want it at the present time. There was a time when the factory looked for at-home workers. Today we have to turn many away. Why?

We do not have enough production areas in the microregions. We cannot provide potential at-home workers with modern, home-type machines. The equipment that our industry is producing dates back to the "Neolithic," and there is not even enough of that machinery. The situation is no better with raw materials. It is true that we can find raw materials. We are now working with so-called goat-fleece roving, and we can also use camel hair successfully. There is more of it. In Moscow, for example, there is a factory of the USSR Ministry of Light Industry that receives raw wool from far away, processes it, and then sends the yarn back to the eastern regions of the country. Wouldn't it be better to avoid such counter-shipments? I am confident that many problems can be successfully decided if we take an understanding and knowledgeable approach to the essence of the matter.

On the average for Moscow enterprises that use at-home labor, each 1,000 workers produce 3 million rubles of output a year. Imagine what a reserve this is on a national scale! But the problem of using at-home labor is not being seriously considered by specialists, scientists, and the mass information media. I think the time has come to make a thorough and comprehensive study of the question.

The joint work experience of our factory and the Krasnogvardeyskiy Rayon executive committee in the capital has had good results. Moreover, we have become convinced that we need to move on from simply using at-home labor to establishing large social-industrial complexes in which the forms of labor organization, working schedules, and living conditions will correspond to the potential and the desires of different social groups.

For example, we can already see today how entire residential developments are "aging," while parallel with them young people's microregions and youth residential developments are appearing. Such "group portraits" have to be taken into account when organizing at-home work, as do many other characteristics of our workers. After all, a significant number of them are people who suffer from serious illnesses. Therefore, it seems to me, there should be sociologists and personnel training inspectors on the staffs of enterprises that use at-home workers. At the present time, unfortunately, such specialists are "not authorized" for us.

The structure of the social-industrial complexes can consist, evidently, of three elements: the large head production facility; a system of branches in



densely populated, mainly outlying regions, where sections are organized near the home; and at-home workers. Not everyone finds it convenient to have a weaving or knitting machine in their apartment. But one of the rooms of the branch can have machines installed and people will come there to work for a few hours.

Of course, this does not mean there will be some kind of uncontrollable situation or anarchy, people saying that they'll work when they want to. No, we are talking about the potential and desires of specific people, and this is what is taken into account when making up the work schedule and planning use of the equipment. Of course, all this does require non-traditional organizational methods by managers; they must show management daring and flexibility and take a truly attentive and supportive attitude toward their people.

The new conditions of economic activity that are now being applied to enterprises of light industry are suitable for social-industrial complexes, which are capable of developing through their own capital. For example, our factory (like other enterprises that use invalid labor) has been authorized to direct 50 percent of planned profit and all above-plan profit to expanding production, buying equipment, and improving working conditions. We make active use of this right that has been given to us and for two five-year plans now have gotten by without a state subsidy. So social-industrial complexes could be organized directly on self-financing conditions, which expand the opportunities for both production and social development of collectives.

Everything I am saying is entirely realistic. In any case, this is exactly how we are trying to expand and develop production, to the extent of the opportunities that are offered. We devote special attention to technical equipping and buying highly-productive modern equipment.

For example, two international forums have been held recently at our factory, with participation by five Italian companies who specialize in the production of knitting machines with broad assortment potential. We have now installed the latest imported machines in our primary production shops for industrial testing. Incidentally, we are now preparing a small share of our output for export.

If they are skillfully organized and intelligently managed social-industrial complexes can become a vital link in the city economy. We need to have a broad discussion of the problems of establishing them, involving specialists and representatives of interested ministries and departments, local Soviets whose areas are experiencing a shortage of labor resources, and managers of enterprises where at-home labor is already in use today. It is very important to look for the appropriate personnel, people who want to become involved in work at home or in sections near the home -- they are the ones who can themselves suggest new forms and methods of labor organization.

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## MOTOR VEHICLES, HIGHWAYS

### VOLGA MOTOR VEHICLE WORKS PRODUCTION FIGURES

Moscow ZA RULEM in Russian No 12, Dec 86 p 2

[Article: "The Ten Millionth"]

[Text] What are 10 million Zhigulis? It is hard to imagine. Nevertheless, we will note for clarification that a column of VAZs [Volga Motor Vehicle Works] standing bumper to bumper would circle the globe at the equator. Or another example. The first in the country to develop lot production of passenger cars was the Russo-Baltic Coachworks in Riga. If you were to line up ten million Zhigulis on the road leading from Riga through Moscow to To'yatti there would be 20 rows of cars!

When vehicles began to come off the conveyor of the Volga Motor Vehicle Works in September 1970, every one of us imagined its gigantic scale of production. We celebrated the assembly of the millionth, the three-millionth, the five-millionth vehicles as big events at VAZ. And here is the hoped-for line--ten million!

People of the older generation remember the 1st Five-Year Plan and the happy fact of the assembly of the hundred thousandth vehicle at GAZ [Gorky Motor Vehicle Works] in 1935. In those days we read articles in newspapers and magazines about the American automotive industry, whose plants produced millions of vehicles annually. We read and believed that the time would come. . .

The road to one million was long and hard for Soviet motor vehicle engineering. In 1984 it took note of "20 million". And now the day has come when vehicle No. 10 million has come off the conveyor of the Volga Motor Vehicle Works.

The success that has been achieved brings joy, and at the same time obliges us. The quantitative side of business is not everything. The main task for Volga auto workers in the coming years is to produce vehicles whose design corresponds to the long-term world level. In September the CPSU Central Committee and the USSR Council of Ministers adopted a resolution which stipulates large organizational measures to establish conditions for the development at VAZ in the current five-year plan of modern models with indicators equal to those of the best world standards. And all the readers of the magazine, congratulating the auto workers on the anniversary vehicle, express the hope that in the coming years the VAZ collective will become the trendsetter in the development of leading motor vehicle designs.

Millions of VAZ Vehicles

No. 1,000,000 -- December 1973  
No. 2,000,000 -- June 1975  
No. 3,000,000 -- December 1976  
No. 4,000,000 -- June 1978  
No. 5,000,000 -- October 1979  
No. 6,000,000 -- March 1981  
No. 7,000,000 -- August 1982  
No. 8,000,000 -- January 1984  
No. 9,000,000 -- May 1985  
No. 10,000,000 -- October 1986

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## MOTOR VEHICLES, HIGHWAYS

### FEATURES OF NEW BelAZ DUMP TRUCK MODELS

Moscow ZA RULEM in Russian No 12, Dec 86 p 2

[Article by I. Matskevich, chief designer: "Belorussian Heroes"]

[Text] The Belorussian Motor Vehicle Works in the city of Zhodino, included in the BelavtoMAZ Association, is alone in the country in producing off-road dump trucks with extra large capacity. These vehicles are indispensable in the construction of energy and hydroelectric facilities and at excavations for coal and other minerals. The plant puts out vehicles with a capacity of up to 170 tons, but the most widely used are the 27-ton BelAZ-540A dump trucks, and not only in the Soviet Union; they operate in Greece and China, Argentina and Turkey, Czechoslovakia and Pakistan--in 40 countries.

This one and another, also widely known vehicle, both in the country and abroad, the 40-ton BelAZ-548A, have been modernized with a view to increasing their productivity, reliability and economy. All the basic units and assemblies have been improved, which made it possible to increase the payload of the vehicles to 30 and 42 tons respectively. Now they are called the BelAZ-7522 and the BelAZ-7523.

What is new in the vehicles produced since 1986? The BelAZ-7522 is equipped with the more economical YaMZ-240M-1 diesel and an LG-470 torque converter with increased efficiency. The hydromechanical transmission and the final drive for the drive axle have been modernized and the brake system is improved. The new parking brake requires less maintenance. Rock-ejectors have been installed for the double rear wheels.

The bed is of a different design and a higher quality metal. The heating section between its walls now creates less resistance to exhaust gases. Original spherical lower supports have been implemented for the hydraulic lift cylinders. We will also mention the changed facing on the radiator block--externally different from the previous model, it facilitates better cooling and cleaning of radiators and has a lower specific quantity of metal.

The improvements carried out in the complex have allowed, in comparison with the BelAZ-540A, a 2-3 percent reduction in fuel consumption, a 13-15 percent increase in the service life of the vehicle and a 25 percent increase in the interval before the first scheduled maintenance.

The innovations in the design of the 40-ton BelAZ-548A that turned it into the 42-ton BelAZ 7523 are similar to those stated: a more economical engine with turbo-supercharging, a new torque converter and parking brake, and changed bed, radiator facing, etc. Thanks to this, the BelAZ-7523 is 10 percent more productive and more economical. Besides this, the longevity of the bed is 25 percent greater, which is particularly important in the transport of very hard rock.

Clearly, the substantial increase in the productivity of the vehicle is directly connected with the facilitation and improvement of working conditions for the driver. For this purpose the cabins have been modernized, and are now equipped with improved seating, a new instrument panel with a shatterproof covering, a more efficient heater, electric windshield washer, spherical rear-view mirrors and improved noise-proofing.

We note that both dump trucks have "doubles", designed for transporting loads with a smaller mass than ore or hard rock--coal or soil. These are the BelAZ-7526 and BelAZ-7527, with beds of 25-30 percent greater volume at the same mass and truck capacity.

Often working in experimental climatic conditions, the BelAZs are also produced in a northern version, designed for especially low temperatures, or they can be equipped with air conditioning.

Specifications for the BelAZ-7522 (in parentheses are differing data for the BelAZ-7523).

General data: wheel formula--4x2; equipped mass--21.52 (29.5) tons; capacity--30 (42) tons; body volume--15 (21) cubic meters; top speed-- 50 kilometers/hour; tires--18.00-25 (21.00-33). Dimensions: base--3550 (4520) millimeters; wheel track: front--2820 (2800) millimeters, rear--2400 (2540) millimeters. Engine: type--diesel, four-stroke, with liquid cooling (with turbo-supercharging); model--YaMZ-240M-1 (YaMZ-240NM-1); cylinders--12; working volume--22,200 cubic centimeters; power--360 (500) horsepower/265 (368) kilowatts. Transmission: hydromechanical (torque converter and three-speed gear-box).

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## RAIL SYSTEMS

### LAGGING RAIL PRODUCTION EXAMINED

Moscow GUDOK in Russian 20 Feb 87 p 2

[Article by V. Gitkovich: "Question for the Ministry of Ferrous Metallurgy: Obviously Defective Products. How Much Longer?: Thousands of Kilometers of New Rails Require Additional Processing, But Even Then Can't Be Used on Main Tracks"]

[Text] Train weights and the loads on each car axle are increasing, as are train speeds. This is useful for transport and the national economy, but damaging to the track rails, since the large dynamic loads and the heavy traffic wear out the tracks faster and cause them to be taken out of service. In order to successfully counteract this, the track and its main element, rails, must be strong.

"If you have two pieces of news, start with the bad," counsel wise people, "so you can console with the good." However, since I don't intend to console anyone, I'll begin with the good news. Everyone can see that in recent years, rails have become not only more massive (nearly 23 kg have been added to each meter), but also stronger. The best grades of rails are rolled from well-killed steel and then hardened either by induction or heat treatment. All this improves reliability and service life.

During the 11th Five-Year Plan, shipments of rails to the railroads increased and the proportion of hardened rails increased, so at first glance, there would seem to be nothing to complain about.

However, the demand for transport and the load on the transport system increased even faster. If you look more closely at the shipment figures and analyze them, you can see not just shortcomings, but even dangerous trends. This is what I want to discuss in greater detail.

We note that railroads measure newly laid rails in kilometers, while steel producers produce them in tons. The plans and output accounting of the latter are all in tons, while the railroads are interested in meters. Of course, it's easy to convert from one to the other, but as we will see below, the tons don't always convert into the needed meters.

Thus, during the past five-year plan, despite the general increase in shipments compared with the 10th Five-Year Plan, the railroads still received 6300 km less track than was specified by the aggregate annual

plans and 8400 km less than was originally planned for the five-year plan. Even the latter figure is only three-fourths of what the railroads actually required to maintain tracks.

The situation has changed little in the present five-year plan. To confirm this, several other figures must be given, although very many already have been given. Thus, with an actual requirement of 127,000 km of track, the Ministry of Railways requested 112,000, while only 89,000 were planned for the five-year plan. But even this plan, unfortunately, is not being fulfilled. In 1986, the first year of the present five-year plan, the transport sector has already been shorted by 520 km of track.

All of this has led to a situation where 35,000 km of steel track presently in service is already beyond its normative service life. Seriously defective rails requiring quick replacement are more frequently found in these sections of track. In general, train speeds must be reduced to avoid problems.

The situation with rails is aggravated by the fact that over 20 percent of the rails received from industry are of nonstandard length. Now we've come to the matter of meters and kilograms. The standard rail lengths are 12.5 meters and its multiple, 25 meters. These are the lengths that the railroads want to receive from the steel producers. But, the main thing for the steel plants is tonnage output. They produce rails by weight, and every fifth rail is shorter than the standard length. These pieces, we can say, are still "rolled steel," but not "rails"; the pieces must be welded with others and cut to standard length, the joints must be machined and holes drilled... Only then will special rolled steel become rail.

According to previous decisions, all these operations must be done at the metallurgical plants, where rail-welding shops were to be established.

However, until now, the rails have been welded by special railroad rail-welding trains (to the detriment of their main task). This load is very appreciable for the trains, accounting for about a fifth of all work. Without this work, the collectives of these enterprises could give more attention to welding seamless track, repairing old rails, surfacing frogs and heels and performing other operations to improve track conditions. In addition, if the welding was done at a metallurgical combine, all the small leftover pieces not worth welding together could be put right back into the open-hearth furnaces; instead, they're now brought out to the rail-welding trains and then taken back to the metallurgical combine.

But especially alarming is the trend: the percentage of rails of nonstandard length is constantly increasing. In 1976, they accounted for 15.3 percent, while in 1980, 19 percent, and for the entire 11th Five-Year Plan, 20.7 percent. In the first year of the 12th Five-Year Plan, 433,000 tons of nonstandard-length rails were received.

The metallurgical plants are now well aware that the railroads will take anything resembling a rail. They're shipping obvious rejects. At the Kuznetsk Combine, they don't even bother to cut out defects that have been

found; rather, they simply mark them with paint. They're saying: take them, cut the defects out yourselves and weld them yourselves if you need rails.

And the railroads take them, although welded rail pieces can't be used on main tracks. Substandard rails (i.e., with improper metal content or geometric dimensions) can't be used for main tracks either. But these rails are also shipped as finished products, and the railroads accept them. What can be done?

It's time to stop the talk and promises to rectify the situation and, instead, start taking some real action. Every year, the railroads haul more ores, fluxes and coke for these same metal producers. The metal producers rightly demand that the full volumes be supplied right on schedule. But good tracks are needed for this: good rails, joint bars, tie plates, bolts and other parts. These are all made at metallurgical enterprises, and it would be good if transport could receive their products in the proper quantities, with standard dimensions and on time. One good turn deserves another.

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## RAIL SYSTEMS

### PLANTS FACE DIFFICULTIES WITH NC MACHINE TOOLS

Moscow GUDOK in Russian 20 Jan 87 p 2

[Article by V. Zhuravlev: "Unwilling Loafers: Why Are Numerically Controlled Machine Tools Idle"; first paragraph is GUDOK introduction]

[Text] The sight of any idle equipment is depressing. But it's doubly or triply aggravating to see high-production numerically controlled machine tools, which sometimes cost in the six-figure range, unwillingly idle. Why is this happening? Our supernumerary correspondent visited the shops of the Voronezh plants of the Main Administration for Rolling-Stock Repair and Spare-Parts Production to find out the answer to this question.

#### Repair is Just More Expensive

What would you say if your television broke down every day and the repair person was a constant visitor? On top of the fact that the periodic blackouts would be a natural irritation, the cost of repair would be an appreciable burden on the family budget. What if the repair person's pay was inversely proportional to the number of calls? This would probably be an incentive to make the repair work as infrequent and as high-quality as possible. The administration of the Locomotive Repair Plant imeni Dzerzhinskiy has already instituted such a pay system for its repair workers servicing numerically controlled [NC] machine-tools.

For the first time in the sector, electronics engineers, programming engineers and repair engineers of the mechanical shop have begun working on brigade contract with a coefficient of labor participation.

What benefit will engineers derive from the implementation of cost accounting? According to the evidence of A. Khamidov, chief of the electronics bureau, an "extra" 80-100 rubles (if a specialist has the highest labor-participation rating and if the section fulfills the plan task).

And, what's the return benefit for the enterprise from the new system of organizing engineering labor?

The downtime of NC machine tools due to breakdowns has been minimized here. The time needed by repair workers to "revive" a complicated mechanism is constantly decreasing. The bureau personnel on their own initiative are independently developing, designing and manufacturing very complicated



equipment for improving the servicing of machine tools. For example, a universal test stand for testing electronic instruments has been put into service in the section.

A second stand, based on two microcomputers, is nearing completion. It is designed for automatic programming and rapid repair of computer modules.

The manufacture by factory personnel of a third stand to repair and correct modules of a wide range of computers will make even a complicated problem in machine-tool electronic circuits easy to eliminate. The bureau workers are promising that it will be put into service in this year without fail...

"We have no complaints about our repair personnel for our NC machine tools," says V. Zhuravlev, chief of the mechanical shop. "Nor any about the collective of this section in general. It's no laughing matter that with our 12 machine tools, the workers of our section produce 1/3 of the plan. And this 'one-third' consists of the most complicated and labor-intensive parts. You understand, that with the great scarcity of machinists in the shop (there are only 35 lathe operators out of the necessary 75) we could never cope with such a work volume. With the shop overall fulfilling its plan, we even realized 87 percent of our contractual obligations for spare parts."

We interrupt Viktor Maksimovich's speech at the percentages he cited. We are interrupting it because this figure has a direct relationship to the work of the half-staffed machine-tool section. Yes, I didn't specify this. While the engineering support for the high-precision equipment is good, the shift coefficient is just barely unity. In other words, every day, these expensive NC machine tools are used for only one shift. Why? Because there's no working front? No, there's a sufficient front. Then what's the problem?

"We're afraid to load this equipment for two shifts," admitted V. Zhuravlev. "If we did, we would never have enough spare parts for them. The plant main administration is practically no help. We have to take our own initiative and get things ourselves at other enterprises in Voronezh; for scarce items, we must send envoys to manufacturers in other cities. Sometimes they understand the situation, sometimes they don't..."

A Fashionable Burden or a Necessity?

"Our NC machine tools operate on two shifts," said M. Baskakov, chief of the mechanical shop of the Railcar Repair Plant imeni Telman.

"Mikhail Vasilyevich," I asked, "what's your equipment shift coefficient?"

The shop chief hesitated. He looked over at V. Ivanov, chief of technological preparation of programs for the NC machine tools, who was sitting opposite: wouldn't the latter give the requested figure? But the latter didn't give it. Sighing, Mikhail Vasilyevich officially readdressed my question to Ivanov. The chief of the technological bureau paused. It was not that Vladimir Fedorovich didn't have the needed information. It's just that the numbers which he was now supposed to give would provide eloquent evidence: the high-production equipment at the Plant imeni Telman

operates at a third of its capacity, while the comment of the shop chief about two shifts was just an attempt to substitute hopes for reality.

"The serviceability coefficient of the NC machine tools at present has been brought up to 0.7-0.75, which makes it possible for us to have a shift coefficient of up to 1.4-1.5," said Vladimir Fedorovich finally, and then, after a silence, added: "In reality, the shift coefficient is 1.01-1.1..."

The technological bureau chief's words require an explanation. For this, we go back a half-year, when the main hinderance to technical progress in the NC machine-tool section was equipment problems. Calls for the quick and proper repair of equipment were little help. How could these calls significantly affect the process of reviving the "sick," if the repair group had very weak skills and very little incentive to produce end results? What led to this situation can be judged by two, in my view, sufficiently eloquent examples. The machine tool with serial number 260 was idled by microprocessor malfunctions from 14 May of the year before last through 15 April 1986. Again, for the same reason, machine tool GF2171 was also an "idler." Its record of do-nothingness was even longer: 13 months. You would agree that for a plant with only 14 numerically controlled machine tools, even the above facts would be more than enough to convince the factory management to think seriously about extreme measures. All the more so since many people wanting to become operators left the shop. Therefore, the factory manager's order to organize on 1 July 1986 an NC machine tool repair group, whose members would be paid in accordance with the serviceability coefficient, was clearly too late.

"We don't have enough operators at the plant," sighs plant chief engineer I. Kikot.

True, there is a personnel problem. But that's not the main problem preventing two- or three-shift operation of this high-efficiency equipment. The plant chief engineer didn't mention this. Why? Because in this case, he would have had to mention the plant's own shortfalls and the obvious inattentiveness of many factory services to the daily needs of the mechanical shop and, in particular, of the NC machine-tool section.

Let's assume for a second that the repair group was able to achieve high operating reliability of the electronic machine-tool equipment. We'll also imagine that the mechanical shop had all operator positions filled. Then what? The plant's output wouldn't change much. I say that because all the forged blanks from the forging shop and castings from the foundry would be machined by the NC machine tools in the first ten days of the month. Then, the progressive equipment won't have anything to do. Consequently, the engineering service of the plant must now concern itself with increasing the production of forged and permanent-mold-cast blanks for the NC lathes.

This would be achievable if the pay system for repair workers and all specialists connected in one way or another with the output efficiency of NC machine tools was further improved. Also, pay must directly depend on the end results of the entire section's work. All the more so since one doesn't have to go far to find similar experience. It's right next door, at the Voronezh Locomotive Repair Plant.

## Instead of an Epilogue

The NC machine tool section of the Plant imeni Dzerzhinskiy is a veritable oasis of leading technology compared with many other shops. Thanks to the efforts of enthusiasts, the section is ready to be fundamentally re-equipped: during the 12th Five-Year Plan, the Dzerzhinskiy workers are to acquire and put into service another 36 machine tools, so that 90 percent of the plan task for the mechanical shop will be manufactured with progressive, high-production equipment. But other related enterprises of the main administration are not hurrying to assimilate this positive experience, which was gained by trial and error. Despite the fact that in recent times the enterprises of the main administration have increased their number of NC machine tools manifoldly, and in the next few years this number will increase nearly geometrically, concern for the efficient use of high-production equipment is expressed only in the factory affairs department of the above-mentioned main administration.

Sadly, it must be stated: this subdivision will not be able to cope at all with the additional tasks given to it. Moreover, the sector enterprises vitally need a plenipotentiary curator who could help the plants with spare parts for NC machine tools and who could gather and propagate leading experience. Possibly, that curator could even realize target orders for the manufacture of test stands, which the Dzerzhinskiy workers themselves are now doing on their own account, for all the sector enterprises. This subdivision of the main administration also would be obligated to monitor the efficiency of equipment replacement at enterprises. It could hardly be considered feasible that the Plant imeni Telman now has 6 (!) different NC devices for 14 machine tools and 7 (!) different electronic drive systems. Need it be said that this variety requires a large inventory of electronic spare parts.

In other words, the sector needs someone to look after its high-precision equipment. This is especially true in the near future, if we want to solve the worker-shortage problem.

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## MARITIME AND RIVER FLEETS

### GOSSNAB OFFICIAL ON IMPROVING SHIPMENTS IN FAR NORTH

Moscow RECHNOY TRANSPORT in Russian No 1, Jan 87 pp 4-5

[Article by V. Mikhaylov, USSR Gossnab deputy administration chief: "The Task is a Complex and Important One: On How to Improve Freight Delivery to the Far North"]

[Text] For steady supplying of the Far North's enterprises and organizations with the products for production and technical purposes, and its population with consumer goods, the USSR Gossnab [State Committee for Material and Technical Supply], jointly with the freight-shipper ministries, the USSR MPS [Ministry of Railways], the RSFSR Minrechflot [Ministry of the River Fleet], and the USSR Minmorflot [Ministry of the Maritime Fleet], has devoted great attention to improving the planning and organizing of the freight's delivery, and to the change-over to the shipment of products to these most important regions of the country in containers and palletized packs [Russian "pakety"--freight pieces stacked together on pallets or skids and secured to these to form a larger shipping unit].

The shipping of packaged-by-the-piece [tarno-shtuchnyye] freight in containers and palletized packs increases labor productivity severalfold, sharply reduces or eliminates the heavy manual labor in transshipment work, saves metal, lumber, and other packing material resources, and also increases intactness of the freight being shipped and reduces its processing's production cost.

Rail, inland waterway, maritime, and motor transport take part in the shipping of freight to regions of the Far North, which gives rise to numerous transshipments of the freight. Taking the complex conditions of its delivery to these regions into account, the Gossnab, jointly with the Minrechflot, the Minmorflot, and the MPS, developed and introduced during the 11th 5-Year Plan a system of ministries' and departments' planning quotas for shipping freight in universal and specialized containers and in palletized packs to the Yakut ASSR and the northern rayons of Irkutsk Oblast through the port of Osetrovo, and by the Northern Sea Route through northwestern and far eastern ports, as well as to regions of the Arctic and Chukotka through maritime transshipment ports.

For solving this important problem, the Gossnab allotted specialized metal, and especially, soft, one-time-use containers, slinging band, pallets [poddony],



wire, and other palletized-packing [paketirovaniye] equipment to the ministries and supplier departments. Interdepartmental questions about additional allocation of universal, and especially, large-tonnage containers, about improvement in making freight cars and ships available, and about palletized packing of specific kinds of products were regularly considered and resolved by an operations group for the Far North attached to the Gossnab.

The work to determine the freight suitable for shipment in containers and palletized packs, including the freight to be shipped to the Kolyma and Indigirka Rivers and Tiksi in large-tonnage containers, was largely completed during 1984-1986. This step contributed, in many respects, to fulfillment of the established quotas for delivering freight to the Arctic and Chukotka.

During the last 2 years of the 11th 5-Year Plan, the receipt of freight in containers through the port of Osetrovo increased by 12 percent, that in specialized containers--2.6-fold, and that in palletized-pack form--1.5-fold. As a result, with overall growth in freight-car traffic by 8 percent, arrival of the most labor-intensive boxcars decreased by 6 percent, and, what is more, the freight in these began to arrive primarily in palletized-pack form. The production cost of the freight's processing decreased by 10.5 percent because of this.

The main bulk of the freight in 1986 (90 percent) arrived at the port in containers and palletized-pack form, and as enlarged freight-piece combinations (in 1980, the figure was 57 percent, and in 1985--75 percent). Because of these measures, the port increased the unloading of freight cars by 13.8 percent during the peak months of the shipping season [navigatsiya], May-July, even with some reduction of workers in the transshipment operations. The number of freight cars remaining in the railroad's Bratsk Division awaiting acceptance for processing was noticeably reduced during August-October. For the sake of objective appraisal, it should be said that the Lena River river transport workers were working under the difficult conditions of shallow water.

However, the favorable results achieved should not satisfy us. In June and July, the port did not fulfill the established quotas for unloading freight cars, the volume of freight transfer in the direct mode--freight car to vessel--declined, and the Gossnab quota for shipping dry cargoes was underfulfilled.

Although the quality of freight transshipment increased, unpreserved shipments still remain significant, and pilfering and deterioration of freight are being tolerated. A number of ministries did not ensure the palletized packing of all their freight being shipped to the Far North. As a result, 10 percent of the packaged-by-the-piece freight is arriving as the small pieces.

Enclosed storage facilities are being built slowly in the port. During 10 years of reconstruction, the area of the open storage facilities has been increased to almost twice as much as before, but the enclosed--by only 25 percent, and, at the same time, the volume of dry cargo shipments has increased 1.4-fold, and that of such bulk, enclosed-storage freight as flour and balanced



fodder--1.6-fold. As a result, much of the freight is being kept in the open areas and under tarpaulin. The resolution about putting in 60,000 square meters of light-metal "Kansk-" type warehouses during 1985-1986 has not been implemented. Thus, there is no potential for increasing the volume of advance freight delivery to the port during the period between shipping seasons.

Practical experience and calculations show that advance freight delivery to the port should constitute approximately 40 percent of the annual delivery volume. If the flour and balanced fodder, for example, are not delivered during the winter period, then daily unloading should be increased by 70 to 80 boxcars during the May-July period, which is not realistic at present. Consequently, it is essential to build enclosed storage facilities and put them into operation at rapid rates, and to continue the advance delivery of freight in the maximum possible volumes.

However, the main avenue to ensuring transshipment of the ever-growing stream of packaged-by-the-piece freight is its containerizing and palletized packing, which will permit increasing the unloading of freight cars during the shipping season. Unfortunately, this problem has not been fully resolved.

The USSR and RSFSR Gosagroproms [State Agroindustrial-Complex Commissions] have not ensured a complete change-over to the palletized packing of canned fruits and vegetables, sugar, tobacco and confectionary products, tea, and table salt; and beverages, juices, and tomatoes continue to arrive at Osetrovo for transshipment in unpalletized form.

The USSR Minstroyaterialov [Ministry of the Construction Materials Industry], the USSR Minneftekhimprom [Ministry of the Petroleum Refining and Petrochemical Industry], the USSR Minlesbumprom [Ministry of the Timber, Pulp and Paper, and Wood Processing Industry], and the USSR Minavtoprom [Ministry of the Automotive Industry] have been shipping a considerable fraction of construction porcelain, glass, automotive and tractor tires, furniture, spare parts, and certain other freight to the Far North in small packages.

The USSR and RSFSR Minkhleboprodukt [Ministries of the Grain Products Industry] have done a considerable amount of work on palletizing flour and balanced fodders. However, they still have much to do for a complete change-over to the shipping of these bulk and most labor-intensive products in palletized-pack form. At present, many boxcars still arrive at the port with flour, balanced fodders, grain fodder, and groats in sacks.

All possible steps also should be taken to improve the quality of the palletized packs of flour and balanced fodder, and to ensure their firm securing in the freight cars, inasmuch as about 20 percent of the palletized packs are being put back together by hand during unloading because of their low quality. As a result, the advantage of the palletized-pack shipments is lessened and, not infrequently, reduced to none. It is essential to introduce, on a large scale, equipment of the Leningrad Railroad Transport Institute's design, tested in 1986, for securing palletized packs in freight cars.

The Ministry of the Grain Products Industry's scientific research organization has not yet found a method for palletized packing of groats, grain fodder, and flour of special grades. This bulk freight traffic should be switched to shipment in the Ministry of Railways' large-tonnage containers, and that from East Siberian Railroad and Krasnoyarsk Railroad stations--in the Lena United River Shipping Company's containers.

The USSR Ministry of the Construction Materials Industry must devote particular attention to increasing the quality of cement packaging in heat-shrink plastic film, and increase the shipping of cement in soft, one-time-use containers of the MKR-1.0S type and palletized packs with slings [strop-pakety].

All freight suppliers and shippers are obliged to eliminate the noted shortcomings prior to the beginning of the 1987 shipping season, and to ship all products in palletized packs and containers, not just to the Yakut ASSR, the Arctic, and Chukotka, but to other regions of the Far North as well.

As analysis shows, further increase in containerized shipments through the Osetrovo Port depends, in many respects, upon the Lena United River Shipping Company, the freight recipients, and the Yakut ASSR's managing agencies.

By the beginning of the 1986 shipping season, the Ministry of Railways, at the Ministry of the River Fleet's request, had fulfilled the Gossnab quota, and had increased the accumulation of freight in containers by 30 percent, as compared with the year before. This measure contributed to growth in the volume of carriages. However, the shipping of loaded containers from the port and the returning of empty ones were unsatisfactorily organized. In May and June, the freight on hand at the port in containers exceeded 100,000 metric tons, and only in August and September, after serious criticism, did the shipping company increase the fleet's availability for shipping it. One of the causes of this abnormal situation, in our opinion, was the shipping company's setting the 2d quarter and July plans for shipping freight in containers too low. The fleet's availability was not in keeping with the receipt of loaded containers from the railroad, considering the accumulation of these during the winter period.

At the same time, something also should be said about the real difficulties of shipping loaded containers in the Lena Basin during the turn of the shipping season (in May). During this period, the bulk of the fleet is sent to the side [tributary] rivers Vilyuy, Amga, and upper Aldan, where it is possible to deliver freight only during the spring high-water period. It must also be taken into account that there are very few landings [pristani] on these rivers that are equipped with the cranes for transferring containers. Of the 130 landings, only 28 can transfer universal containers and 5--the large-tonnage ones. It is essential for the shipping company to increase the number of such landings. The optimum periods for the advance delivery of containers should be determined. Accumulation of the loaded containers destined for points on the Vilyuy River and the other tributary rivers should be begun during February-March, and a sufficient number for the fleet's first voyages should be on hand by the beginning of the shipping season. In connection with the shortage of containers, further increase of freight arrival in them should begin in May and be continued during the shipping season.

The organization of freight carriages in containers requires radical improvement in the containers' return in the empty state and their removal from the port by the railroad. A proper solution to this problem has not been found during a number of years. About 35,000 of the Ministry of Railways' medium-tonnage containers, that is, almost one-third of those shipped from Osetrovo, annually remain through the winter in the Lena Basin. The shipping company and the freight recipients are obliged to expedite the containers' turnaround.

Along with this, the East Siberian Railroad is unsatisfactorily allocating the freight cars to remove empty containers from the port. The Gossnab decree about making 150 freight cars available for this purpose daily has not been implemented. In July, 117 freight cars were made available, in August--107, in September--54, and in October--only 25. As a result, over 10,000 containers remained constantly in the port, and, by the end of the shipping season, the number of the medium-tonnage ones had increased to 20,000, and that of the large-tonnage ones to 3,000. The Ministry of Railways is obliged to eliminate this serious shortcoming in organizing the removal of empty containers from the port.

The most simple and economical way to increase the volume of freight carriages to the Far North is to ship the freight in palletized-pack form. The Gossnab will develop even further the proven practice of introducing economical palletized-packing equipment for one-time use: Band [strap] and wire slings, soft containers, light pallets [poddony], heat-shrink plastic film, and polypropylene tape.

The standard palletized packs of piece freight weighing no more than 1 metric ton, which arrive in boxcars, must be combined into palletized-pack blocks weighing up to 4 metric tons in the port. The Gossnab is allocating wire to the port for this purpose.

Freight recipients are obliged to prepare for receiving freight in palletized-pack blocks. For this purpose, enterprises of the USSR Minsvetmet [Ministry of Nonferrous Metallurgy], the Yakutglavsnab [Yakut Material and Technical Supply Main Administration], and others must have an exchangeable pool [park] of transport and technological pallets [poddony] and suitable freight-grabbing and freight-lifting technical equipment.

An interesting and promising recommendation has been submitted by the TsNIIIEVT [Central Scientific Research Institute for Water Transport Economics and Operation] and the Osetrovo Port's technologists about making up standardized transport palletized packs on platform containers (flety [flats]) having bottom and top corner pipe fittings in the dimensions of series 1S or 1SS large-tonnage containers. In such flats, open from the top, from the sides, and possibly even from the ends, it is practicable to transport assorted freight in the standard palletized packs and soft one-time-use containers having a gross weight of up to 20 metric tons--automotive and tractor tires, and other freight not harmed by atmospheric precipitation. The indicated large-load pallets [poddony] should be put to use first of all in the inland waterway

communications from Osetrovo to the ports receiving large-tonnage containers. This will permit raising freight transfer operations to a new technological level and better utilizing the large-capacity crane mechanization and storage areas in the ports.

The Ministry of the River Fleet, with the aid of the Mintyazhmash [Ministry of Heavy and Transport Machine Building] and the Gosnab, should manufacture the first lot of this new transport equipment and organize trial freight shipments in 1987.

Under the intensive national-economy development conditions of the Yakut ASSR and Irkutsk Oblast's northern rayons during the 12th 5-Year Plan, freight shipments will increase annually, and the intensity in Port Osetrovo's work will not slacken. Therefore, despite the high maritime tariffs, part of the freight for the Yana and Indigirka Rivers and to Yakutsk will be delivered by the Northern Sea Route. Substantial deficiencies in the seamen's and river transport personnel's work were tolerated on this line during the closing period of the 1986 shipping season. As a result, about 10,000 metric tons of assorted freight, mainly cement, were not delivered to points on the Yana and Lena Rivers, and spent the winter at Tiksi. These shortcomings in the Tiksi Regional Center's work must not be repeated.

Another reserve for slackening the intensity in the Osetrovo Transport Center's work and reducing the expensive freight carriages by the Northern Sea Route is developing the production of different kinds of products right in the Yakut ASSR and Irkutsk Oblast's northern rayons. Increasing the production of standard houses, brick, cement, precast reinforced concrete, and other products is in mind.

Large amounts of money were spent on developing and reconstructing the port during the 10th and 11th 5-Year Plans. The old freight districts were reconstructed, and new ones were built--the Eastern and Northern, including a large container terminal. The length of the quay wall and its open storage area was almost doubled, and the freight-transfer equipment was modernized. The material and technical base of the railroad's Lena Station and Bratsk Division received a corresponding development. Thus, realistic conditions were created for substantial improvement of all the Lena-Osetrovo Transport Center's work. However, the problem of increasing the depths in the upper Lena River remains unresolved. Two low-water shipping seasons, and especially the last one, in 1986, exacerbated the problem to the limit.

The insufficient depths in the 300-kilometer Ust-Kut to Kirensk sector are causing significant underloading of vessels and having a negative effect on the organization of fleet traffic. The national economy is sustaining huge losses from additionally arising freight transshipments and the loss of fleet carrying capacity, and from the large expenditures associated with freight delivery by the Northern Sea Route. The USSR Gosplan [State Planning Committee], on the Ministry of the River Fleet's recommendation, has recognized it as essential to construct a low-head transport hydraulic-engineering system [gidrouzel] for appropriate increase of the depths in the indicated limiting sector.

The practical resolution of this most important problem now depends upon the USSR Mintransstroy [Ministry of Transport Construction] and the USSR Gosstroy [State Committee for Construction Affairs].

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## MARITIME AND RIVER FLEETS

### PRODUCTION ASSOCIATION TO COORDINATE YAKUT MARITIME SHIPPING

Moscow VODNYY TRANSPORT in Russian 14 Feb 87 p 1

[Article by V. Zbarashchenko, USSR Maritime Fleet deputy minister, under the "Effectiveness of Our Reports" rubric: "'The Hypnosis of Favorable Statistics'"]

[Text] An article under this headline ["The Hypnosis of Favorable Statistics"] was published in the "VT" ["VODNYY TRANSPORT"] of 9 December last year.

The facts of the gross violations of planning and personnel-financing discipline tolerated in the Northeast Maritime Fleet Administration and the Tiksi Port were correctly interpreted in it for the most part.

The reasons for the significant exceeding of the limit on number of workers established for the 3d quarter, and the wage-fund overexpenditure permitted in connection with this, have been examined at the ministry. The situation that had developed in the SVUMF [Northeast Maritime Fleet Administration] was reviewed in the Minmorflot [Ministry of the Maritime Fleet] Collegium in implementation of a resolution adopted in the collegium on 17 November 1986, and a minister's order was issued.

The persons who permitted the extravagance in using labor and wage-fund resources have been brought to strict disciplinary and pecuniary account, and the SVUMF Chief, T. Lukin, has been relieved of the position being held.

The steps taken during November-December 1986 have permitted liquidating the SVUMF indebtedness in wages that had developed during the 3d quarter of last year without the provision of financial assistance on the ministry's part. Preliminary analysis of the results of applying the new wage rates [rastsenki] for loading and unloading work has shown that the pay for 1 metric ton of cargo unloaded by ships' crews increased by a factor of 1.4 in the SVUMF during 1986. A commission was sent to Tiksi in January of this year to check on the correctness of the wage rates' application.

Measures to reduce the above-standard and excessive material costs have been developed by the SVUMF, transformed into the Yakut Maritime Transport Production Association (YaPOMT) as of 1 January of this year. Implementation of these measures will be monitored by the V/O MorteKhsnab [All-Union Material and Technical Supply Association for the Maritime Fleet].

An earlier opening of navigation [the shipping season] in the ports of Pevek and Tiksi has become realistic with augmentation of the shipping company's fleet by Norilsk-type large-tonnage ships of the ice-reinforced class. Without this step, it will no longer be possible to provide guaranteed delivery of the growing volume of freight to the freight recipients. The YaPO [Yakut Production Association] has arranged for part of the fleet's remaining through the winter in the ports of Pevek and Zelenyy Mys to receive transshipment cargo for the Kolyma River from Norilsk-type ships. The need for the ships' spending the winter in these ports will continue to exist until the lighter-carriage system's placing in operation, which will begin as of 1989.

The ministry annually sends four or five of the YaPO's ships to the Far East Basin for the accomplishment of planned yard [zavodskiy] repair. The withdrawal of five ships, for which the cargo-carriage plan accordingly was established for the periods before and after undergoing repair, was foreseen by the "Arctic Measures" for 1986.

The ports, when determining the necessary number of dock workers, proceed on the basis of the planned cargo-processing volume determined according to USSR Gossnab [State Committee for Material and Technical Supply] quotas. The USSR Gossnab's quotas for freight delivery to the Yakut ASSR through the port of Tiksi have not been being fulfilled in recent years because of nonpresentation of the freight to be transported by the freight shippers. The Minmorflot is carrying on work with the USSR Gossnab to put the planning in order.

At present, the ministry is implementing measures to strengthen the management and simplify the organization of the YaPO, to reduce the number of its workers further, and to create the necessary conditions for the enterprise collective's normal work under the conditions of full cost accounting and self-financing.

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